SANTA CLARA VALLEY WATER DISTRICT

INSTREAM WETLAND VEGETATION

REGROWTH STUDY

SECOND ANNUAL REPORT: RESULTS FOR 1999

Prepared in Accordance With

The California Regional Water Quality Control Board
San Francisco Bay Region
Order 98-088

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EXECUTIVE SUMMARY

This is the second in a series of four annual reports for the Santa Clara Valley Water District's (District) Instream Wetland Vegetation Regrowth Study (Study). This report has been prepared in accordance with California Regional Water Quality Control Board, San Francisco Bay Region (Board) Order 98-088.

The purpose of the Study is to better define the nature of wetland impacts resulting from the District's sediment removal projects in earthen flood control channels by studying vegetation reestablishment after excavation. The Study documents vegetation reestablishment on portions of 12 tidal and nontidal 1997 and 1998 sediment removal project sites (Excavation Sites), and monitors the wetland vegetation on other sites (Reference Sites) not currently subject to sediment removal. The Study assesses the amount and characteristics (vegetation dominance and quality) of wetland vegetation during the peak of the growing season prior to project implementation and for the next 3 years thereafter. This second year report presents results of second year postproject assessments for the 1997 Excavation Sites, first year postproject assessments of the 1998 Excavation Sites, and Reference Site Assessments.

Results of first and second year postproject surveys on 1997 Excavation Sites and first year surveys on 1998 Excavation Sites indicate that substantial total wetland vegetation regrowth occurred within 1 year after excavation and that expansion of vegetation continued in the second year. Overall, regrowth on 1997 Excavation Sites was 45% in 1998 and 67% in 1999; 1998 Excavation Site regrowth was 96% after 1 year.

In 1999, the total nontidal wetland amount on Excavation Sites approached or surpassed preexcavation amounts (98% regrowth after 2 years on 1997 sites; 133% after 1 year on 1998 sites). Overall tidal regrowth was approximately ⅓ to ½ that was seen in nontidal sites (29% regrowth after 2 years in 1997 sites; 69% after 1 year in 1998 sites). Regrowth on individual tidal sites was also generally less than on individual nontidal sites. Some tidal sites experienced almost no regrowth within 1 or 2 years, whereas all nontidal sites showed substantial regrowth within 1 year after excavation. Total wetland vegetation remained about the same or increased on Adjacent Reference Sites and nontidal General Reference Sites between 1998 and 1999; the total amount of wetland vegetation on tidal General Reference Sites declined slightly.

Vegetation dominance and quality (as represented by vegetation type, total percent cover of vegetation, and relative percent cover of native and invasive species) had similarities between years on both Excavation and Reference Sites. However, most sites did experience some change in either dominance or quality. Most changes were either neutral or positive (e.g., full or partial transition from one native-dominated vegetation type to another; disappearance of a nonnative vegetation type; increased total percent cover). Potentially negative changes (e.g., increased invasive species cover; appearance or increase in amount of a nonnative vegetation type; decrease in total percent cover) were fewer. There was no clear differentiation in the tendency for changes in vegetation dominance or quality to occur in Excavation Sites as compared to Reference Sites, with the exception of the initial reduction in tall perennial emergent vegetation (Cattails) seen in certain nontidal Excavation Sites.

The dramatic vegetation shift observed on North and South Morey Channels between 1997 and 1998 was still largely in effect in North Morey Channel in 1999. In the first postproject year, low-stature native wetland vegetation either partially or completely replaced the entirely cattail-dominated wetland in both locations. In 1999, low-stature native wetland vegetation was present in both locations, but the increase in amount of cattail-dominated vegetation in South Morey Channel indicated that the site may be converting back to exclusive dominance by cattails.

INTRODUCTION

BACKGROUND AND PURPOSE

The District maintains channelized streams (flood control channels) in Santa Clara County to ensure that they have a continuing functional life and provide the level of flood protection originally designed. Sediment removal, which removes both accumulated sediment and associated vegetation that reduces the ability of the channels to carry design flows, is a major component of the maintenance program and is the maintenance activity that most affects wetland resources in channels under District jurisdiction.

The purpose of the Study is to better define impacts to instream tidal and nontidal wetlands resulting from the District's sediment removal projects in flood control channels by increasing our understanding of the process of vegetation reestablishment after excavation. The major extent of instream wetlands in Santa Clara County occurs in flood control channels because there is little or no overstory to shade out wetland plants, and the relatively wide, level channel beds result in more wetted surface area. Channels with these types of features are also where the majority of sediment removal activity occurs and are the primary focus of this study.

The objectives of the Study are to determine the rate, extent, and vegetation characteristics of wetland vegetation reestablishment after sediment removal. The Study will document reestablishment characteristics on portions of selected 1997 and 1998 sediment removal project sites (Excavation Sites), and will also monitor the status of wetlands on study sites not currently subject to sediment removal (Reference Sites). The study will include up to 3 years of postproject surveys. After 3 years, the need for further study will be reassessed based on current needs and Study results.

The Study is designed to assess wetland regrowth at Excavation Sites during each of the next 3 years following excavation. Therefore, wetlands are assessed during the time of year when growth is expected to be at or near its peak (generally August through October in perennial and tidal streams, and early summer for intermittent streams). The Study incorporates information acquired from other studies conducted between 1995 and 1997, as well as information acquired specifically for the Study (see Rankin and Hillman 1998). This allows us to take advantage of an expanded range of applicable information obtained since sediment removal work first recommenced in 1997 after a several year interruption.

Clearly, wetland vegetation does reestablish in flood control channels previously cleared of sediment and vegetation due to facility construction and maintenance activities. However, prior to this Study, no comparative data on preproject and postproject wetland vegetation extent or characteristics were available. The Study represents a continuing evolution in our understanding of instream wetlands, District operations and maintenance, and long-term sampling procedures. District biologists will continue to refine Study protocols and other Study features, as needed, to improve overall effectiveness and work efficiency without compromising the project objectives.

This report describes the scope of the Study and presents the findings of the 1999 surveys.

STUDY OVERVIEW

The Study involves field assessments of the extent and vegetation characteristics of instream wetlands in areas affected by the District's sediment removal activities.

- **Survey Content**: Surveys, conducted annually, will determine the extent of jurisdictional wetlands present, qualitatively characterize vegetation features, and photodocument site appearance.

- **Excavation Sites**: Selected 1997 and 1998 sediment removal project sites will be studied. The amount of wetland present on each site was determined prior to the start of each project. Preproject assessments of Excavation Sites will serve as a baseline for regrowth comparisons. Results of postexcavation surveys conducted annually for up to 3 years following the project will be compared to the baseline to determine recovery extent and characteristics.

- **Reference Sites**: Reference Sites are study sites that have not been impacted by sediment removal for at least 5 years. Reference Sites are located either near Excavation Sites (Adjacent Reference Sites) or at other locations within the District's projected long-term sediment removal work area (General Reference Sites). Reference Sites will be surveyed annually (unless impacted by sediment removal during the course of the study) and will provide background information on instream wetlands dynamics independent of sediment removal disturbance.

- **Report of Findings**: Wetland quantity and vegetation characteristics for each site will be reported annually. Current year site conditions will be compared with conditions of past years. Any trends in quantity and vegetation characteristics in project and reference sites will be discussed.

This is the second in a series of four annual reports to be submitted for this Study. Included in this report are:

- Second year postproject (1999) assessments for the 1997 project Excavation Sites
- First year postproject assessments (1999) for the 1998 project Excavation Sites
- 1999 assessments for all Adjacent Reference Sites
- 1999 assessments for all General Reference Sites

The following were included in the first annual report (Rankin and Hillman 1999):

- Preproject assessments for the 1997 project Excavation Sites
- First year postproject (1998) assessments for the 1997 project Excavation Sites
- Preproject assessments for the 1998 project Excavation Sites
- 1998 assessments for all Adjacent Reference Sites, and prior year assessments for some sites
- 1997 and 1998 assessments for all nontidal and one tidal General Reference Site, and 1998 assessments for all other tidal General Reference Sites.

METHODS

Information for this Study was gathered from a variety of sources including studies conducted to assess instream wetlands on other District projects and from assessments conducted specifically for this study. Sources include Thomas Reid Associate (1995), H.T. Harvey and Associate (1997), individual maintenance project assessments conducted by District biologists and Ms. Kathy Lyons of Biotic Resources Group in 1997 and 1998, and surveys conducted by District biologists in 1997 to estimate the amount of wetlands in the District's proposed long-term maintenance program work area (see Rankin and Hillman 1999 for prior results and methods). 1998 and 1999 surveys were conducted specifically for the Study using the standard protocol described below.

STUDY SITES

The three types of study sites, Excavation, Adjacent Reference, and General Reference, are described below.

Excavation Sites

There are 12 Excavation Sites (Table 1, Figures 1 and 2;) located on 4 of 5 1998 and 9 of 11 1997 earthen channel Sediment Removal Project sites [note: reported as 13 study sites in Rankin and Hillman 1999 because Berryessa upstream (u/s) Lower Penitencia was excavated in both 1997 and 1998 (TRA 1995, TRA 1997, SCVWD 1998)]. Nine of the Excavation Sites include the entire length of the corresponding Sediment Removal Project Site. These sites were studied in whole, because either the Sediment Removal Site was not very large, or transitions in project or vegetation features were likely to occur on the site.

Three Excavation Sites, Lower Penitencia Creek, Saratoga Creek, and Sunnyvale East, consist of a portion (approximately 64%, 61%, and 67%, respectively) of each corresponding Sediment Removal Site. The features of the channel, project, and preproject vegetation on Saratoga and Lower Penitencia were homogeneous throughout each site. Therefore, subsampling the project area was sufficient to adequately assess features of the original project site, and the amount of each project area that could be captured on one aerial photograph was selected for study. Aerial photographs were taken and the study was planned to include the downstream (d/s) reach of the Sunnyvale East sediment removal project; however, this segment was dropped from the project late in the planning process. Instead, the u/s segment of the remaining length of project site, Highway 237 to Carribean Drive, was selected for study (the small remaining segment d/s of this supported little wetland). In future study years, subsampling of other lengthy Study Sites may be instituted if interim study results indicate that there is little variability in amount or features of the recovering wetlands along the site length.

The Excavation Sites were defined the following way for projects on tidal sites, where sediment removal only affects one side of the channel. The Berryessa Creek u/s of Lower Penitencia and San Tomas Aquino u/s of Highway 237 Excavation Sites include the entire channel within the study reach. The Lower Penitencia Excavation Site includes the entire west channel (the east channel is the Adjacent Reference Site). San Tomas u/s of Great America and Sunnyvale East

Excavation Sites consist only of that portion of the study reach that was actually excavated. For Sunnyvale East, this comprises the entire east bank; with the west bank acting as the Adjacent Reference Site. For San Tomas, where excavation alternated from side to side several times, and often did not completely remove all of the vegetation on the excavated bank side, the Excavation Study site comprises alternating portions of both banks. All unexcavated areas of the reach, regardless of bank position serve as the Adjacent Reference Site. The Excavation Site on San Tomas was determined by mapping the extent of excavation after the project in using field surveys, a January 1999 aerial photo and GIS. Areas not affect by excavation comprise the Adjacent Reference Site.

Preproject assessments were conducted for all 1997 and 1998 Excavation Sites prior to sediment removal. To date, first and second year postproject assessments have been conducted for all 1997 Excavation Sites and first year postproject assessments have been conducted for all 1998 Excavation Sites. Data from the 1997 preproject assessments will be used as the baseline for postproject comparisons. Although the 1995 preproject assessment data will not be used for the baseline, the data was presented in the first annual Study report because it provides relevant information regarding past conditions, provides additional information on temporal variation in wetlands, and was the basis of project impacts assessments for environmental review and permitting documents (TRA 1995 and 1997).

Reference Sites

There are two types of reference sites. Adjacent Reference Sites are located near Excavation Sites, and General Reference Sites are situated at random locations within the District's projected long-term sediment removal program area (Tables 2 and 3, Figures 1 and 2).

Adjacent Reference Sites

Adjacent Reference Sites will be used to monitor wetland vegetation conditions in areas near Excavation Sites. These sites provide a point of reference from which to distinguish those features of the nearby reestablishing site that are directly related to the sediment removal impact and those that reflect variability related to other causes. For example, if flooding scours a streambed within an Excavation Site, it would likely scour the streambed in the Adjacent Reference Site. By comparing both sites, conditions resulting from flood scouring could be distinguished from conditions resulting from sediment removal.

Adjacent Reference Sites were selected to be as similar to Excavation Study Sites as possible. However, in most cases, areas adjacent to Excavation Study Sites differ in one or more features, such as channel configuration, width, length, vegetation abundance, or hydrology. No reference site is identical to an Excavation Site. For tidal Excavation Sites in which only one side of the channel was excavated (Lower Penitencia, and Sunnyvale East), the opposite, unexcavated sides serve as the reference. In the case of San Tomas u/s of Great America all unexcavated portions of the project reach regardless of bank serve as the reference (see Excavation Site section above). Suitable reference sites were not available in some cases because adjacent areas were too dissimilar from Excavation Sites or were proposed excavation sites. The location and approximate length of each Adjacent Reference Site is listed in Table 2. Adjacent Reference Sites were first surveyed in 1998, except Lower Penitencia, Jones and South Morey Channel, which were also surveyed in prior years.

General Reference Sites

General Reference Sites will provide additional information regarding the general background condition and interannual variability of instream wetlands not recently impacted by sediment removal. Locating General Reference Sites within the District's projected long-term program sediment removal work area ensures that the channel reaches randomly selected for study have features likely to support instream wetlands (e.g., modified channels with relatively flat beds and little overstory vegetation).

General Reference Sites were randomly selected in the following way:

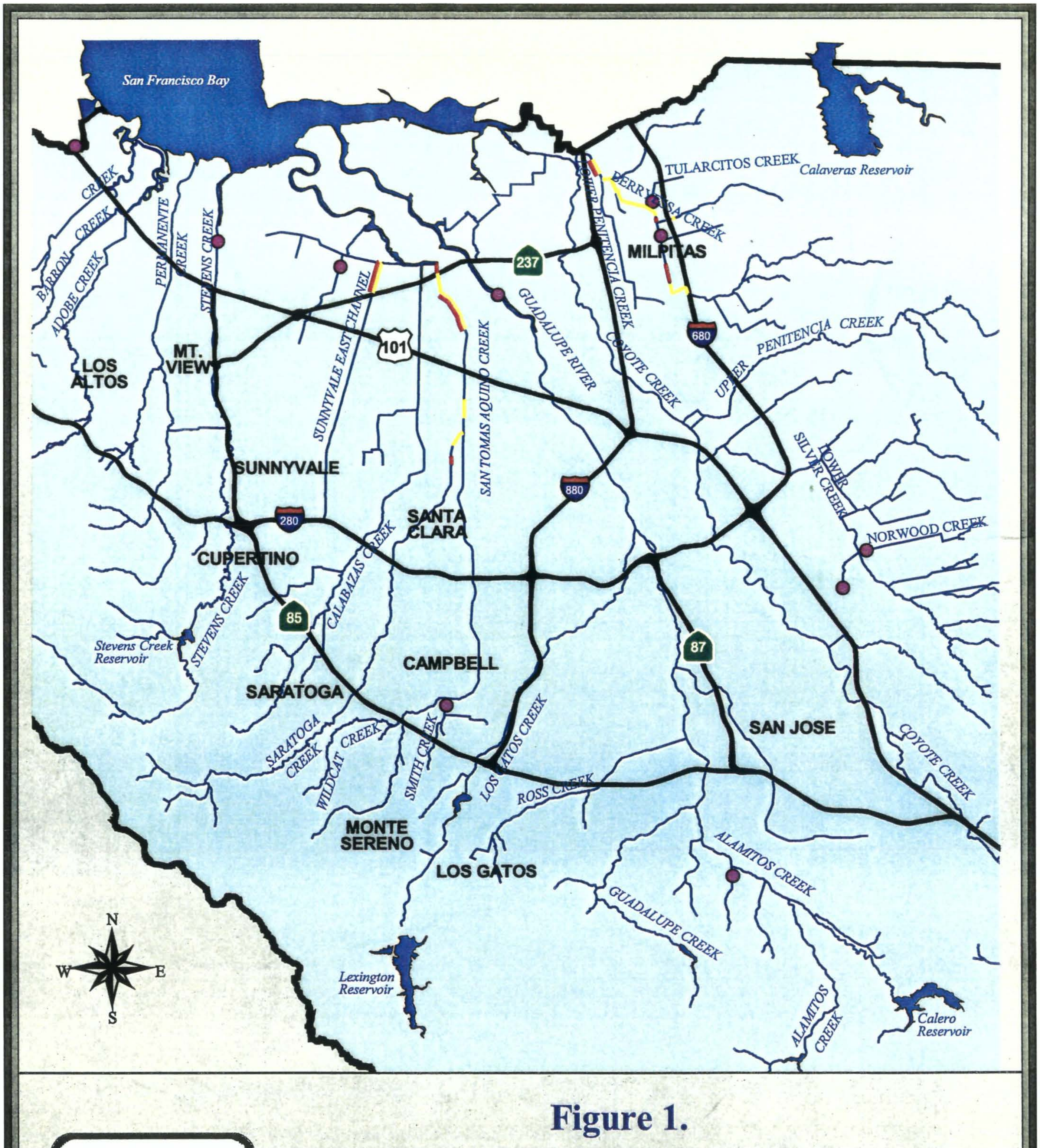
- All earthen channels with at least 1,000 linear feet of projected sediment excavation work area were considered for study. If the work area on a reach of stream ("work reach") had heterogeneous features (e.g., variable channel widths), it was segmented into homogeneous subreaches (e.g., having similar widths).

- Study sites are 10% samples, by length, of the total work reach or subreach. The location of the study site within the reach was selected randomly using the District's stream station identification numbers.

- The selected study site locations were identified by station number on a District facilities map, and then located in the field for surveying.

General Reference Sites could not be part of any area subject to or planned for sediment removal in 1997 or 1998 or part of an Adjacent Reference Site.

Ten nontidal General Reference Sites were randomly selected from approximately 50 sites meeting the study criteria (Table 3). The four tidal sites represent all proposed long-term maintenance program reaches meeting the study criteria. Nontidal sites were first sampled in 1997; tidal sites were sampled beginning in 1998. (Note: the Guadalupe River tidal site was first sampled in 1997 by H.T. Harvey and Associates (1997) as part a survey for the Lower Guadalupe flood control project, H.T. Harvey 1997.)



Legend

🟨 Excavation Site

🟥 Adjacent Reference Site

● General Reference Site

Figure 1.

Wetland Vegetation Regrowth

Study Site Locations: North County

Santa Clara Valley Water District

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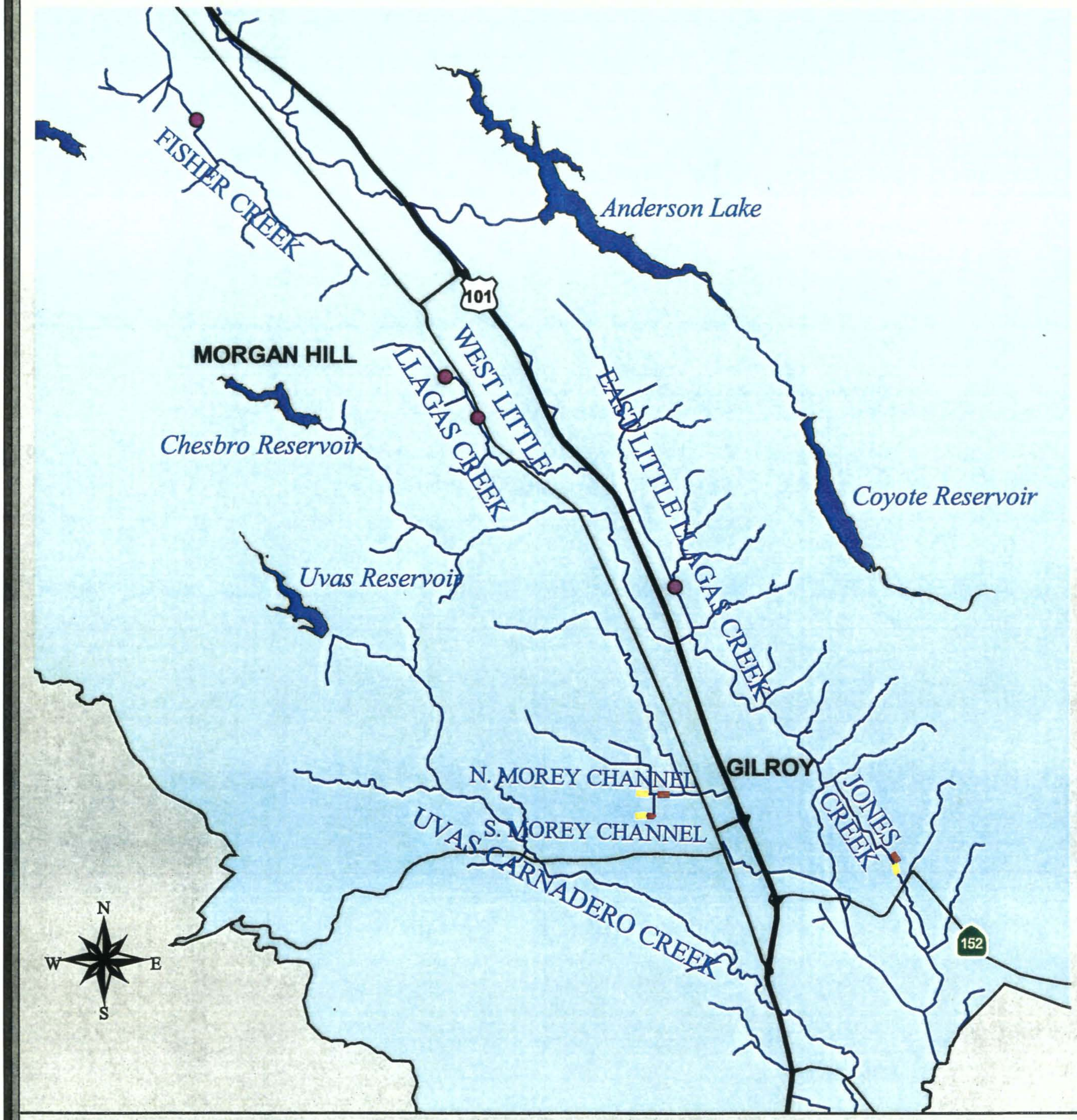

Figure 2.

Wetland Vegetation Regrowth

Study Site Locations: South County

Santa Clara Valley Water District

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TABLE 1
Excavation Sites

Stream	Location	Tidal	Nontidal	Approximate Length (ft.)
1997 Excavation Study Sites				
Berryessa Creek u/s Lower Penitencia	(same as 1998 site)	—	—	—
Jones Creek	d/s Highway 152	—	X	920
Lower Penitencia Creek	d/s Milmont Avenue	X	—	1,915
Los Coches Creek	d/s Park Victoria Drive	—	X	310
North Morey Channel	d/s Santa Teresa Boulevard	—	X	1,010
San Tomas Aquino Creek (tidal portion) u/s Highway 237	Highway 237 to Great America Parkway	X	—	2,500
San Tomas Aquino Creek (nontidal portion)	u/s Central Expressway	—	X	2,300
Saratoga Creek	u/s San Tomas Aquino confluence	—	X	2,000
South Morey Channel	d/s Santa Teresa Boulevard	—	X	830
1998 Excavation Study Sites				
Berryessa Creek u/s Lower Penitencia	Lower Penitencia Creek to Calaveras Boulevard	X	X	8,600
Berryessa Creek	u/s Montague Expressway	—	X	3,500
San Tomas Aquino (tidal portion) u/s Great America Parkway	Great America to u/s of Hetch Hetchy Pipeline crossing	X	—	5,300
Sunnyvale East Channel	d/s Highway 237	X	—	2,500
			TOTAL:	**31,685 ft., 6.0 mi.**

TABLE 2
Adjacent Reference Sites

Excavation Study Site	Corresponding Adjacent Reference Site	Approximate Length (ft.)
Berryessa Creek u/s Lower Penitencia Creek	Berryessa Creek d/s Los Coches Avenue	500
Jones Creek	Jones Creek d/s Excavation Study Site	920
Lower Penitencia Creek	Lower Penitencia parallel to Excavation Site (east channel)	1,915
Los Coches Creek	None	—
North Morey Channel	Lions Creek, d/s Kern Avenue	1,000
South Morey Channel	South. Morey d/s Excavation Site	830
San Tomas Aquino Creek (tidal portion) u/s Highway 237	San Tomas Aquino d/s Highway 237	700
San Tomas Aquino Creek (nontidal portion) u/s Central Expressway	None	—
Saratoga Creek u/s San Tomas Aquino Creek	Saratoga Creek u/s Warburton Avenue	1,020
Berryessa u/s Lower Penitencia	Same as Berryessa above	—
Berryessa u/s Montague Expressway (1998)	Berryessa d/s Montague Expressway	2,200
San Tomas Aquino (1998 tidal portion) u/s Great America Parkway	San Tomas Aquino parallel to Excavation Study Site	5,300
Sunnyvale East d/s Highway 237	Sunnyvale East Channel parallel to Excavation Study Site (west bank)	2,500
	TOTAL:	**16,895 ft., 3.2 mi.**

TABLE 3
General Reference Sites

Stream	Location (Station Number)	Approximate Length (ft.)
Nontidal Sites		
Berryessa Creek	109+85-112+00	215
East Little Llagas	45+00-47+20	220
Fisher Creek	149+00-150+00	100
Greystone Creek	11+00-13+10	210
Lower Silver Creek	373+95-375+00	105
Norwood Creek	7+80-11+00	320
Smith Creek	8+80-10+00	120
Tularcitos	9+00-12+80	380
West Little Llagas u/s of Cosmo Avenue	100+00-101+00	100
West Little Llagas d/s of Main Avenue	152+00-152+80	80
Tidal Sites		
Guadalupe River	318+00-325+50	750
San Francisquito	73+00-74+00	100
Stevens	90+00-92+20	220
Sunnyvale West	58+00-62+40	440
	TOTAL:	**2,920 ft., 0.6 mi.**

SITE ASSESSMENTS

Wetlands assessed in all years were identified based on criteria set forth in the Corps of Engineers 1987 Wetland Delineation Manual (Environmental Laboratory 1987). Wetlands were identified based on 3 parameters as defined by the Corps: hydrophytic vegetation, hydric soils and wetland hydrology. Potential wetlands were first identified based on site vegetation features. If the "prevalent vegetation consists of macrophytes that are typically adapted to areas having hydrologic and soil conditions" that occur in wetlands then the criterion for wetland vegetation was met. Hydrophytic species are classified as Obligate (OBL), Facultative Wet (FACW), and Facultative ([FAC] Reed 1988, Appendix A). If the vegetation criterion was met, the site was further investigated to determine the hydrology status. Positive wetland hydrology indicators for study sites most frequently consisted of visual observation of inundation and/or soil saturation. Other positive indicators included the presence of water marks, drift lines, waterborn sediment deposits, water-stained leaves, algal mats and drainage patterns within wetlands. The soils of instream sites best fit the descriptions of either Riverwash or Tidal Marsh soils (Soil Conservation Service 1968). These both are classified as hydric soils by the Soil Conservation Service (1992). In addition, soils in tidal and inundated areas were subject to an aquic or peraquic moisture regime. In order to assess wetland extent, all surveys since 1997 have been conducted late in the growing season (generally August through October for tidal and perennially wet streams; early summer for summer-dry streams). In 1995, several sites were surveyed early in the growing season. The late-season 1997 data, rather than the early-season 1995 data, will be used for comparison with postproject data. No update of 1995 data was available in 1997 for one 1997 Excavation Study Site, Berryessa u/s of Lower Penitencia.

Color 35mm or digital photographs were taken of each site during the field surveys. On sites that were repeatedly surveyed, photographs were taken, in most cases, from the same vantage point during successive surveys.

Nineteen ninety-nine was a slightly drier-than-average rainfall year. Mean seasonal rainfall in San Jose was 11.10 inches, slightly below the historic mean of 14.24 inches. This followed four successive wetter-than-average years. The year 1998 was the fourth in a series of wetter than average years Rainfall in San Jose in the 1997-1998 rainfall year, for example, was 29 inches, over double the historic mean.

Wetland vegetation reacts rapidly to changes in water availability, and amount and locations of wetlands are expected to vary depending on immediate past conditions. Jurisdictional wetlands, by definition, pertain to conditions found under "normal circumstances." In practice, features that have deviated due to "abnormal" circumstances can be difficult to identify, especially in the disturbed systems that are the focus of this study. However, in wetter than average cycles, assessment of wetland boundaries based on current conditions may lead to the overestimate of jurisdictional area, while in drier than normal years, assessments based on current conditions may lead to underestimation. Except for 1999, all Study assessments have been conducted during high rainfall years and may therefore reflect an overestimation of actual jurisdictional wetland.

Vegetation Description

All 1998 and 1999 surveys were conducted using the standard protocol described below. The 1995 and some of the 1997 assessments, were conducted prior to formalizing the vegetation characterization protocol (see Rankin and Hillman 1999 for pre-1999 assessment details).

Information sufficient to complete the SCVWD Wetland Assessment Checklists was gathered in the field (checklists presented in Appendices B, C, and D). Information included the determination of the Vegetation Dominance Type (Table 4) and Vegetation Quality Indicators (Table 5) of each wetland type.

The Vegetation Dominance Type categories represent vegetation dominance types typically found within local streams. The tall, native, grasslike perennial emergents that are typical dominants, were collectively assigned a separate category for nontidal wetlands (e.g., cattail, bulrush, burred, or mix), because these wetlands have a distinctive physiognomy. The grasslike emergents are further separated into species-specific categories (Alkali Bulrush, etc.) in tidal areas, because species may correlate with salinity gradients. The Other Natives category in tidal and nontidal areas includes wetlands dominated by natives other than the typical tall, grasslike, emergents. Locally common dominants include watercress (*Rorippa nasturtium-aquaticum*), yellow water primrose (*Ludwigia peploides* spp. *peploides*), tall cyperus (*Cyperus eragrostis*), and a variety of smartweeds (*Polygonum* spp.)

Classification of vegetation characteristics first entailed viewing the site to become familiar with the wetland type or types on site. A wetland was considered to be one type if topographic position, dominance type, and quality indicators were fairly uniform. After creating a list of component species, the Vegetation Dominance Type and Vegetation Quality Indicators were estimated. On rare occasions, vegetation quality characteristics were so close to the edge of a category that its categorization was uncertain. In such cases, both categories were indicated for that particular feature.

Site assessments were conducted by botanists or wetland scientists experienced with vegetation sampling methods. Qualitative (semiquantitative) categorization of vegetation within broad, easily distinguished classes is a standard vegetation description procedure used in ecological studies (Bonham 1989, Mueller-Dombois 1975).

TABLE 4
Vegetation Dominance Types

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burred, or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native(s)	
f. Nonnative	
g. Other (describe)	

TABLE 5
Vegetation Quality Indicators

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	76-100%	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	5% or less	6-25%	26-50%	51-75%	76-100%

Only those species considered to be aggressive invaders of local wetlands were designated as invasive species for the purposes of classification of vegetation quality. These were limited to broad-leaf peppergrass (*Lepidium latifolium*) and giant reed (*Arundo donax*). Numerous other nonnative, weedy species occur regularly in local wetlands, but based on current knowledge, these are either naturalized, or not specifically known to encroach into already occupied habitat. Common examples included Italian ryegrass (*Lolium multiflorum*), cocklebur (*Xanthium strumarium*), bristly ox-tongue (*Picris echioides*), creeping bentgrass (*Agrostis stolonifera*), barnyard grass (*Echinochloa crus-galli*), and dallis grass (*Paspalum dilatatum*). All plant nomenclature is per the Jepson Manual (Hickman 1993).

Determination of Wetland Area

Wetland area, in all years, was determined using standard methods for wetland delineation including (1) field measurement; (2) delineation of boundaries, as determined in the field, onto transparent mylar sheets overlain on aerial photographs (scale 1"=50'); or (3) a combination of 1 and 2 (for prior measurement exceptions see Rankin and Hillman 1998).

Photographs were primarily used for mapping wetland boundaries on sites where the extent of the wetland was relatively large. Smaller sites had narrow channels or limited extent of wetland, such that wetland areas would not be easily visible on photographs at the 1"=50' scale. These sites were, and will continue to be sampled solely by field measure: these include all General Reference Sites (except the Guadalupe River site), Berryessa Creek u/s Montague Expressway, Jones Creek, and North and South Morey Channels. Photographs for several fairly large sites were first available in 1999 for the Sunnyvale East Excavation and Adjacent Reference, San Tomas Aquino d/s of Highway 237 Adjacent Reference, and Saratoga Creek Adjacent Reference Sites. In prior years, wetland amounts here were determined by field measure.

Assessments conducted with aerial photographs taken prior to 1997 used blueline reproductions of rectified photographs. Acreage determinations were made either with AutoCad (computer aided design program) or by planimetry. With only two exceptions, since 1997, all photographs have and will continue to be taken in color. The photographs are taken in mid to late summer, during the growing season, and as close as possible to the time of field surveys. Photographs are taken near noon and during low tides (on tidal sites).

All 1997, 1998 and 1999 aerial photographs were transferred into digital form for rectification and measurement. Aerial photograph diapositives were scanned into digital raster files. At least five photo-identifiable points in each photograph were surveyed with differentially corrected GPS, producing coordinates (California State Plane Coordinate System, Zone 3, North American Datum [N.A.D.] 83) used to rectify each photograph with Autodesk Imaging software. Photo-control points are expected to be within a 95% confidence ellipse of less than three feet from their actual location. The data were used to produce a geo-referenced image for use in ESRI's Arcview 3.1 Geographic Information System (GIS). Wetland boundary information from the mylar overlays, or delineated directly onto the electronic image, was digitized into the GIS.

Boundaries of excavation areas were directly digitized onto postproject digital aerial photographs (shots in winter of 1997 and 1998) in the GIS to determine the actual limits of excavation (and the actual amount of wetland removed) on the partially excavated tidal sites (1997 San Tomas (tidal) u/s Highway 237 and Lower Penitencia; 1998 Berryessa u/s of Lower Penitencia and San Tomas (tidal) u/s Great America Sites). Boundaries between excavated and unexcavated areas were easily distinguishable on photographs. For the 1998 San Tomas (tidal) u/s Great America Site, the delineated boundary of excavation also defines the Excavation Study Site. In 1999, using the GIS, the excavation area mapped in 1998 was superimposed upon the wetland area mapped in 1999 in order to determine the amount of wetland present within the Excavation Study Site. All wetland outside the excavation boundaries on the project reach, is part of the Adjacent Reference Site. The same approach will be used to measure wetlands on the 1998 project San Tomas Aquino (tidal) Excavation and Adjacent Reference Sites in future years.

To ensure that precision of data comparisons was not overestimated, measurements on the larger Excavation Study and Adjacent Reference Sites are reported to the nearest 0.1 ac, rather than 0.01 ac. Calculations were conducted using measures to the nearest 0.01, and small discrepancies may result from rounding errors. Measurements on the smaller General Reference sites, which were consistently field-measured, will be reported in square feet (sq ft) and to the nearest 0.01 ac.

1999 Sampling Exceptions

North and South Morey Channels Bridge Construction

Two bridges, each approximately 200 ft wide, were under construction on both North and South Morey Channels at the time of the 1999 surveys. The impact zones comprised 200 feet of the North Morey Excavation Study Site, 130 feet at the d/s end of the South Morey Excavation Study Site, and 70 feet at the u/s end of the South Morey Adjacent Reference Site. Water was diverted around the impact areas, the stream beds were dry, and the bed and banks were devoid of vegetation. The wetland amounts presented in the 1999 Assessment Summary and Comparison tables are the actual amount of wetland present on each of these sites in 1999. These values are also used in comparison tables.

In order to determine the affect of the disturbances on the Study, calculations were made to determine the amount of wetland estimated to be present within the impact area in past years, and projected to have been present this year had there been no construction disturbance. Due to the uniform features of the Morey Channels, these figures can be readily calculated. For prior years, the amount of wetland within the current impact area was determined by multiplying the average width of wetland within the impact area by the length of impact area. For this year, the amount of wetland projected to occur in the impact area was determined by multiplying the average width of wetland in the channel adjacent to the impact area by the length of the impact area.

Berryessa d/s Montague Adjacent Reference Site

Surveys were conducted twice in 1999 for the nontidal Reference Site on Berryessa Creek in order to determine differences in wetland on-site relating to seasonal growth. Most of the site is perennially wet due to an outfall near the u/s end, but the corresponding Excavation Study Site is dry in the summer. The Excavation site is currently surveyed in June before the stream goes dry, but the Reference Site surveys are conducted in late summer, the typical sampling time for perennial streams. In 1999, one survey was conducted in June, concurrent with survey in the corresponding Excavation Study Site. The other survey was conducted in September. The September data are used in the summary and comparison tables to provide between-year consistency. The June data provide background information on vegetation characteristics in the Reference Site and Excavation Site during the same season.

Future Assessments

Postproject Excavation Study Site surveys and Adjacent Reference Site surveys will be conducted annually for 3 years after each project is completed (year 2000 for 1997 project sites and year 2001 for 1998 project sites) or until the next sediment removal activity occurs on an Excavation Site, if sooner. General Reference Site surveys will continue until all Excavation Site surveys are completed. If sediment removal occurs at an Adjacent or General Reference Site during the course of the Recovery Study, further study of the site may be discontinued.

1997 EXCAVATION SITES

The results of the second year postproject 1999 assessments for the 1997 project Excavation Sites are summarized in Table 6; checklists and site photographs are located in Appendices B and E.

1997 Project Excavation Sites: Preproject, First and Second Year Postproject Comparisons

Wetland Acreage

Total wetland regrowth in 1999 compared to removal in 1997 on all eight 1997 Excavation Sites was 67% (Table 7). A total of 6.5 acres (ac) of wetland was present in 1999. This is 2.1 ac less than the 8.6 ac present in 1997 prior to excavation, but 1.4 ac more than was present in 1998. In 1998, there was 45% regrowth compared to 1997 removal.

Total nontidal wetland regrowth (six sites) in 1999 compared to removal in 1998 was 98% (Table 7). A total of 3.4 ac of wetland was removed in 1997 and had regrown by 1999. In 1998, there was 65% regrowth compared to 1997 removal. Wetland amounts were not exactly the same for individual sites in 1997 and 1999, but no site varied more than 0.2 ac between years. Wetland regrowth amounts equaled or exceeded the amount removed on three sites, and wetland amounts increased from 1998 to 1999 on every site but North Morey where the amount of wetland decreased from 0.3 to 0.2 ac. The ability for wetland to grow on North Morey was diminished by bridge construction, as described in the following section.

Total tidal wetland regrowth (two sites) in 1999 compared to removal in 1997 was 29%. This was a slight increase from 21% in 1998. The amount of wetland present in the two 1997 tidal excavation sites increased little from 1998 to 1999. Total tidal regrowth comprised 0.8 ac in 1999, an increase from 0.6 ac in 1998.

Vegetation Dominance and Quality

The vegetation dominance types in the second postproject year (1999) were the same on five of six nontidal sites as in the first postproject year [(1998)Table 7)]. As in 1998, Other Native vegetation was present on all five sites; two sites also had Cattail-dominated vegetation, and one site also had Nonnative vegetation.

Cattail-dominated vegetation appeared for the first time on the sixth site, Saratoga Creek, where it accounted for half the vegetation in 1999. The remainder of the site remained dominated by Other Natives.

Table 6. 1997 Project Excavation Sites: Summary of Second Year Postproject (1999) Assessments

Site	Month Surveyed	Survey Method[1]	Wetland Area [2,3] (acres)	Vegetation Dominance Type[4]	Vegetation Quality Indicators[5]
Berryessa u/s Lower Penitencia (see Table 8)					
Jones	Sept.	field	0.2	Other Native	AAA
			0.2	Cattail[6]	AAA
		Site Total =	**0.3**		
Los Coches	Sept.	field/photo	0.1	Other Native	ABA
			0.0	Nonnative	ADA
		Site Total =	**0.1**		
Lower Penitencia	Oct.	field/photo	1.0	t-California Bulrush	ABB
North Morey	Sept.	field	0.2	Other Native	AAA
San Tomas (tidal): u/s Hwy. 237 to G. America Pkwy	Sept.	field/photo	1.1	t-California Bulrush	AAA
			0.9	t-Other Native	ABA
		Site Total =	**2.0**		
San Tomas (nontidal): u/s Central Expressway to SPRR	Sept.	field/photo	1.3	Other Native	AAA
Saratoga	Sept.	field/photo	0.5	Other Native	AAA
			0.7	Cattail	AAA
		Site Total =	**1.2**		
South Morey	Sept.	field	0.2	Other Native	AAA
			0.2	Cattail	AAA
		Site Total =	**0.3**		

[1] Survey Method: field/photo = field surveys with photograph; field = field measures only; photo= photographic measures, not field-surveyed

[2] 0.0 indicates wetlands were present but < 0.05 acres

[3] Numerical discrepancies can be accounted for due to the rounding of values.

[4] See Table 4: Vegetation Dominance Type: t = tidal

[5] See Table 5: Vegetation Quality Indicators

[6] "Cattail" in the nontidal sites was the dominant species in the "Cattail, Bulrush, Burreed, or mix" category.

Table 7. 1997 Project Excavation Sites: Preproject (1997), First and Second Year Postproject (1998 and1999) Comparisons

			WETLAND AREA (acres)[1]			CHANGE FROM					
Site	1997	1998	1999	Amount of Wetland Removed (1997)	Amount of Wetland Regrowth (1999)	1997 to 1998	1998 to 1999	1997 to 1999	1998 Regrowth Compared to 1997 Removal (%)	1999 Regrowth Compared to 1997 Removal (%)	Vegetation Dominance and Quality Status[3]
Nontidal											
Jones	0.4	0.2	0.3	0.4	0.3	-0.2	0.1	-0.1	58	85	As in 1998, remains dominated by natives, including Cattails (not previously dominant in 1997); vegetation quality indicators unchanged.
Los Coches[2]	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	267	433	Both Nonnative and Other Natives-dominated vegetation still present, but Other Natives is now more abundant. Vegetation quality indicators unchanged except for increase in density of the Nonnative vegetation type.
North Morey	0.4	0.3	0.2	0.4	0.2	-0.1	-0.1	-0.2	64	41	Remains dominated by Other Natives from conversion from Cattails; higher native species relative cover.
San Tomas u/s Central Expressway	1.2	0.4	1.3	1.2	1.3	-0.8	0.9	0.1	30	111	Remains dominated by Other Natives; vegetation quality indicators unchanged.
Saratoga	1.1	1.1	1.2	1.1	1.2	0.0	0.1	0.1	98	107	Over half the site is now dominated by Cattails rather than Other Natives; vegetation quality indicators unchanged.
South Morey	0.4	0.3	0.3	0.3	0.3	-0.1	0.0	-0.1	64	76	Fully excavated portion remain dominated by Cattails as in '97 and '98. Half-excavated portion now dominated by Cattail in addition to Other Natives; total percent cover and relative cover of natives increased in the Other Natives vegetation type. Vegetation quality indicators remain unchanged in the Cattails type.
Nontidal subtotal	3.5	2.3	3.4	3.4	3.4	-1.2	1.2	-0.1	65	98	

Table 7. Continued.

	WETLAND AREA (acres)[1]					CHANGE FROM					
Site	**1997**	**1998**	**1999**	**Amount of Wetland Removed (1997)**	**Amount of Wetland Regrowth (1999)**	**1997 to 1998**	**1998 to 1999**	**1997 to 1999**	**1998 Regrowth Compared to 1997 Removal (%)**	**1999 Regrowth Compared to 1997 Removal (%)**	**Vegetation Dominance and Quality Status[3]**
Tidal											
Lower Penitencia	1.4	0.9	1.0	1.0	0.6	-0.5	0.2	-0.3	52	67	Remains dominated by California Bulrush; increase in amount of invasive species relative cover; other vegetation quality indicators unchanged. The small Nonnative wetland in 1998 is no longer present.
San Tomas u/s Highway 237	3.8	1.9	2.0	1.9	0.2	-1.8	0.1	-1.7	5	9	The California Bulrush vegetation type increased slightly since 1998 and now comprises over half the vegetation on-site. Vegetation quality indicators are unchanged. Nonnative-dominated vegetation is no longer present. The quality indicators of the Other Natives vegetation are unchanged.
Tidal subtotal	5.1	2.8	3.1	2.9	0.8	-2.3	0.3	-2.0	21	29	
Total	**8.6**	**5.1**	**6.5**	**6.3**	**4.2**	**-3.5**	**1.4**	**-2.1**	**45**	**67**	

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[1] Numerical discrepancies can be accounted for due to the rounding of values.

[2] 0.0 indicates wetlands were present but < 0.05 acres

[3] "Cattails" in the nontidal sites were the dominant species in the "Cattail, Bulrush, Burreed, or mix" category.

Vegetation quality indicators remained unchanged on three of six sites between 1998 and 1999, including Saratoga Creek on which dominance partially changed. The quality indicator changes on the other three sites comprised increases in vegetation density (total cover) and native species relative cover within individual vegetation types. Total cover was in the highest cover category (75% to 100%) in all vegetation types, and relative cover of invasive species was in the lowest cover category (5% or less).

North and South Morey Channels both experienced more pronounced changes in both dominance and quality from 1997 to 1998 than from 1998 to 1999. Between 1998 and 1999, vegetation dominance remained the same on North Morey, and the relative percent cover of native species increased by one category. The half-excavated portion of South Morey had no change in dominance or quality. In the fully-excavated section, cattail-dominated vegetation, present in 1997 but not 1998, accounted for approximately half the wetland in 1999. The other half remained dominated, as in 1998, by Other Natives, in which, as on North Morey, the relative percent cover of natives increased.

Both tidal sites experienced some change from 1998 to 1999. All the vegetation on Lower Penitencia (tidal), both remnant and regrowth, was California bulrush-dominated in 1999; the small amount of Nonnative wetland present only in 1998 was gone. Invasive species cover increased slightly to the lower end of the 6% to 25% cover category. Most of the vegetation on San Tomas u/s of Highway 237 (tidal) is remnant rather than regrowth. Both Other Native and California bulrush-dominated vegetation were still present, but the Bulrush rather than Other Native now comprised over half the wetland. Nonnative wetland, present in 1998, was gone. Total vegetation cover was high (76% to 100%) in all vegetation types

North and South Morey Channels Bridge Construction Impacts

Two 200-foot wide bridges, one each on North and South Morey Channels, were constructed in 1999 as part of an adjacent residential development. The bridges affect a 200-foot long section of the North Morey Excavation Site, 130 feet of the South Morey Excavation Site, and 70 feet of the South Morey Adjacent Reference Site. At the time of the 1999 surveys, the channels were vegetated with wetlands except in the areas affected by bridge construction. The areas spanned by the bridges are expected to remain barren in the future due to shading. The amount of wetland that was estimated to be present in past years within the new bridges' spans is listed in Table 8. The amount of wetland projected to have occurred this year in the bridges' impact areas, if there had not been construction impacts, is also given (see methods). This projection was based on the amount of wetland per unit area in the undisturbed channel segments directly adjacent to the impact areas.

1998 EXCAVATION SITES

The results of the first year postproject 1999 assessments for the 1998 project Excavation Sites are summarized in Table 9; checklists and site photographs are located in Appendices B and F.

Table 8. North and South Morey Channels: 1999 Bridge Construction Wetland Impacts

Site	Total Wetland Present	Est. Wetland in Bridge Impact Area [Ac (sq. ft.)][1]	Wetland Outside Bridge Impact Area[1]	Total 1999 Wetland plus Estimated Bridge Impact[1]
1997				
North Morey Excavation Site	0.39	0.08 (3400)	0.31	
South Morey Excavation Site	0.38	0.06 (2600)	0.32	
South Morey Reference Site	0.38	0.03 (1400)	0.25	
1998				
North Morey Excavation Site	0.25	0.06 (2720)	0.19	
South Morey Excavation Site	0.26	0.06 (2470)	0.2	
South Morey Reference Site	0.34	0.03 (1260)	0.31	
1999				
North Morey Excavation Site	0.16	0.05 (2240)	0.16	0.21
South Morey Excavation Site	0.30	0.06 (2470)	0.30	0.36
South Morey Reference Site	0.32	0.03 (1264)	0.32	0.35

[1] See Methods section for explanation of calculations

Table 9. 1998 Project Excavation Sites: Summary of First Year Post-Project (1999) Assessments

Site/Year	Month Surveyed	Survey Method[1]	Wetland Area (acres)[2]	Vegetation Dominance Type[3]	Vegetation Quality Indicators[4]
Berryessa L. Pen to Calaveras	Sept.	field/photo	0.3	t-Nonnative	AEA
			0.6	t-Cattail	AAA
			0.2	t-Other Native	ABA
			0.3	t-Nonnative	ACA
		Tidal Subtotal	**1.3**		
			1.4	Other Native	AAA
			0.2	Nonnative	AEA
			0.2	Nonnative	ADA
			2.1	Nonnative	(BC)DA
			0.5	Nonnative	ACA
		Nontidal Subtotal	**4.5**		
		Site Total	**5.8**		
Berryessa u/s Montague to Hwy 680	June	field	0.0	Nonnative	ADA
			0.1	Nonnative	CEA
		Site Total =	**0.1**		
San Tomas (tidal) u/s Great America Pkwy	Aug.	field/photo	0.5	t-Nonnative	ACA
			0.5	t-California bulrush	ABA
		Site Total =	**1.1**		
Sunnyvale East	Sept.	field/photo	0.0	t-Other Native	BAA

[1] Survey Method: field/photo = field surveys with photograph; field = field measures only; photo= photographic measures, not field-surveyed.

[2] Numerical discrepancies can be accounted for due to the rounding of values.

[3] See Table 4: Vegetation Dominance Type: t = tidal

[4] See Table 5: Vegetation Quality Indicators

1998 Project Excavation Sites: Preproject and First Year Postproject Comparisons

Wetland Acreage

Total wetland regrowth was 96% in 1999 compared to removal in 1998 on all four 1998 Excavation Sites (note: the Berryessa u/s Lower Penitencia Excavation Site has tidal and nontidal portions, and is assessed separately under tidal and nontidal comparisons for a total of five comparison sites but only four Excavation Sites) (Tables 9 and 10). A total of 7.0 ac of wetland were present in 1999; 7.2 ac were present in 1998. Of the 7.0 ac present in 1999, 4.6 ac were regrowth (4.8 ac was removed in 1998); the remainder were remnant vegetation not excavated in 1998.

Total nontidal wetland regrowth was 133% in 1999 compared to removal in 1998 (Table 10). Both nontidal sites had over 100% wetland regrowth. Of the 4.5 ac present in 1999, 2.7 ac comprised regrowth.

Total tidal wetland regrowth was 69% in 1999 compared to removal in 1998. Individual site regrowth was variable on the three sites representing very little, about half, and triple the original amounts removed in 1998 (2%, 53%, and 300%). Of the 2.4 ac present in 1999, 1.9 ac comprised regrowth.

Vegetation Dominance and Quality

Each study site supported some vegetation similar in dominance and quality to that present in 1998; each site also experienced some changes in either vegetation dominance or quality (Table 10).

There were two nontidal sites. On Berryessa u/s Lower Penitencia (tidal reach), there was the same amount of Other Native vegetation and more Nonnative vegetation than present in 1998. The Cattail-dominated vegetation present in 1998 was absent. Much of the Other Native and Nonnative vegetation had higher vegetative cover. The vegetation on Berryessa u/s Montague Expressway remained dominated by Nonnatives as in 1998. There was more vegetation overall on this site, but some of it had lower total vegetative cover.

Three tidal sites were surveyed. On Berryessa u/s Lower Penitencia (nontidal reach), Cattail and Nonnative vegetation remained major wetland components, but a small amount of Other Native vegetation first appeared in 1999. There was higher relative cover of natives in the Cattail vegetation. On San Tomas, Nonnative vegetation still comprised about half the wetland; the remainder was dominated by California Bulrush rather than the Other Natives present in 1998. The small amount of regrowth present on Sunnyvale East consisted only of one species, the native "common threesquare" (*Scirpus pungens*) resulting in the same "Other Native" vegetation dominance category (although not the same native species composition) as in 1998.

Table 10. 1998 Project Excavation Sites: Preproject (1998) and FirstYear Postproject (1999) Comparisons

	WETLAND AREA (acres)[1,2]				CHANGE FROM		
Site	1998	1999	Amount of Wetland Removed (1998)	Amount of Wetland Regrowth (1999)	1998 to 1999	1999 Regrowth Compared to 1998 Removal (%)	Vegetation Dominance and Quality Status
Nontidal							
Berryessa u/s Lower Penitencia	3.8	4.5	2.0	2.6	0.6	132	Both Other Natives and Nonnative-dominated vegetation are still present, but the Nonnative is now more abundant than the Native. Cattail-dominated vegetation is no longer present. Other Natives and some Nonnative vegetation have higher percent cover.
Berryessa u/s Montague Expressway	0.1	0.1	0.1	0.1	0.0	180	Remains dominated by Nonnatives; reduction in amount of invasive vegetation; lower total % cover in one section of study site.
Nontidal subtotal	3.9	4.5	2.0	2.7	0.7	133	
Tidal							
Berryessa u/s Lower Penitencia	0.8	1.3	0.3	0.8	0.6	300	Cattail and Nonnative vegetation both increased. Relative cover of natives in Cattail-dominated vegetation increased. Some Other Native vegetation is now present.
San Tomas (tidal) u/s Great America Parkway	2.0	1.1	2.0	1.1	-0.9	53	Nonnative vegetation still comprises about half the vegetation. No change in quality indicators. Other Natives vegetation no longer present, but California Bulrush is now present.
Sunnyvale East	0.5	0.0	0.5	0.0	-0.5	2	Almost no vegetation overall, but what is present remains dominated by Other Natives; slightly greater native species relative cover.
Tidal subtotal	3.3	2.4	2.8	1.9	-0.9	69	
Total	**7.2**	**7.0**	**4.8**	**4.6**	**-0.2**	**96**	

[1] Numerical discrepancies are due to the rounding of values.

[2] 0.0 indicates wetland present but at value less than 0.05.

ADJACENT REFERENCE SITES

The results of the 1999 assessments for the Adjacent Reference Sites are summarized in Table 11; checklists and site photographs are located in Appendices C, E, and F.

Adjacent Reference Sites: 1998 and 1999 Comparisons

1997 Project Adjacent Reference Sites

Wetland Acreage

Total wetland present in the six 1997 Project Adjacent Reference Sites in 1999 was 116% of that present in 1998 (Table 12). A total of 5.2 ac was present in 1999, 0.7 ac more than in 1998. Nontidal and tidal wetlands amounts were 112% and 118% of the 1998 values, respectively. The total nontidal and tidal wetland amounts were 1.7 ac and 3.5 ac, respectively. Wetland amounts either remained about the same or increased on all individual sites. (Note: prior to site surveys approximately 0.03 ac of wetland was removed from the South Morey site due to bridge construction; see Table 8.)

Vegetation Dominance and Quality

The vegetation dominance categories on the four nontidal sites remained the same as in 1998 (Tables 11 and 12). These comprised Cattails and Other Native vegetation types. The overall percent cover increased by one category on one site and was in the highest cover category (76% to 100%) for all sites; relative cover of natives within native-dominated vegetation increased on two sites. Invasive species relative cover was in the lowest cover category on all sites.

Dominant vegetation categories changed on both tidal sites from 1998 to 1999, but both sites remained dominated by tall, perennial, emergents (Tables 11 and 12). On Lower Penitencia, dominant vegetation changed from Cattail/bulrush mix to the California bulrush vegetation type. On San Tomas d/s Highway 237, cattails increased, resulting in a change from dominance by California bulrush to Cattails. A small amount on Nonnative wetland also was reported. A one-category increase in relative cover of natives occurred on the Lower Penitencia site.

1998 Project Adjacent Reference Sites

Wetland Acreage

Total wetland present in the four 1998 Project Adjacent Reference Sites in 1999 was 143% of that present in 1998 (Table 13). A total of 2.5 ac was present in 1999, 0.8 ac more than in 1998. Nontidal and tidal wetlands amounts were 353% and 123% of the 1998 values, respectively. The total nontidal and tidal wetland amounts were 0.5 ac and 2.0 ac. Wetland amounts increased on all individual sites.

Table 11. Adjacent Reference Sites: Summary of 1999 Assessments

Site	Month Surveyed	Survey Method[1]	Wetland Area [2] (acres)	Vegetation Dominance Type[3]	Vegetation Quality Indicators[4]
Nontidal					
Berryessa d/s Los Coches Avenue	Sept.	field/photo	0.1	Nonnative	ACA
			0.1	Other Native	AAA
		Site Total =	0.2		
Berryessa d/s Montague Expwy.	Sept.	field	0.4	Other Native	ABA
Jones	Sept.	field	0.2	Other Native	AAA
			0.1	Cattail[5]	AAA
		Site Total =	0.3		
Lions (North Morey reference site)	Sept.	field	0.6	Cattail	AAA
Saratoga	Sept.	field/photo	0.6	Other Native	AAA
South Morey	Sept.	field	0.3	Cattail	AAA
Nontidal subtotal			2.3		
Tidal					
Lower Penitencia	Oct.	field/photo	2.1	t-California Bulrush	AAA
San Tomas (tidal) d/s Highway 237	Sept.	field/photo	1.3	t-Cattail	AAA
			0.1	t-Other Native	AAA
		Site Total =	1.4		
San Tomas (tidal) u/s of Great America Parkway	Aug.	field/photo	1.6	t-California Bulrush	ABA
Sunnyvale East	Sept.	field/photo	0.4	t-Other Native	BBA
Tidal subtotal			**5.4**		
Total			**7.7**		

[1] Survey Method: field/photo = field surveys with photograph; field = field measures only

[2] Numerical discrepancies can be accounted for due to the rounding of values.

[3] Vegetation Dominance Type: t = tidal

[4] See Table 5: Vegetation Quality Indicators

[5] "Cattail" in the nontidal sites was the dominant species in the "Cattail, Bulrush, Burreed, or mix" category.

Table 12. 1997 Project Adjacent Reference Site Comparisons for 1998 and 1999.

Site	Wetland Area (acres)			Change from'98 to '99 (ac)	1999 Wetland compared to 1998 (%)	Vegetation Dominance and Quality Status
	1997[1]	1998	1999			
Nontidal						
Jones	0.3	0.3	0.3	0.0	100	Remains dominated as in 1998 by Other Natives and Cattails (Bulrush present in only very low quanities in 1999). As last year, Other Native vegetation is twice as abundant. Vegetation quality indicators unchanged.
Lions (North Morey reference site)	---	0.4	0.6	0.1	125	Remains dominated by Cattails; relative cover of natives increased.
Saratoga	---	0.5	0.6	0.1	120	Remains dominated by Other Natives; total percent cover and relative cover of natives increased.
South Morey	0.3	0.3	0.3	0.0	94	Remains dominated by Cattails; vegetation quality indicators unchanged.
Nontidal Subtotal	**---**	**1.5**	**1.7**	**0.2**	**112**	
Tidal						
Lower Penitencia	1.8	1.5	2.1	0.5	133	Transition from Cattail/bulrush mix to California Bulrush; relative cover of natives increased.
San Tomas (tidal) d/s Highway 237	---	1.4	1.4	0.0	101	Change in dominance from California Bulrush to Cattails; some Other Natives now present; vegetation quality indicators unchanged.
Tidal Subtotal	**---**	**2.9**	**3.5**	**0.5**	**118**	
Total	**---**	**4.5**	**5.2**	**0.7**	**116**	

[1] Several sites were not surveyed until 1998.

Table 13. 1998 Project Adjacent Reference Site Comparisons for 1998 and 1999.

Site	Wetland Area (acres)		Change from'98 to '99 (ac)	1999 Wetland compared to 1998 (%)	Vegetation Dominance and Quality Status
	1998	1999			
Nontidal					
Berryessa d/s Los Coches Ave.	0.1	0.2	0.1	178	Still dominated by Other Natives; Nonnative is now a second vegetation type and comprises 1/3 of the site. Vegetation quality indicators unchanged.
Berryessa d/s Montague Expressway	0.1	0.4	0.3	617	Change in dominance from Other Natives and Nonnatives to Other Natives only; higher native species relative cover.
Nontidal Subtotal	**0.2**	**0.5**	**0.4**	**353**	
Tidal					
San Tomas (tidal) u/s of Great America Parkway	1.3	1.6	0.3	123	Change in dominance to California bulrush from Other Natives and Nonnatives; vegetation quality indicators unchanged.
Sunnyvale East	0.3	0.4	0.1	124	Remains dominated by Other Natives; vegetation quality indicators unchanged.
Tidal Subtotal	**1.6**	**2.0**	**0.4**	**123**	
Total	**1.7**	**2.5**	**0.8**	**143**	

Vegetation Dominance and Quality

Three of the four sites had some change vegetation dominance; vegetation quality indicators changed on just one site. On Berryessa d/s of Los Coches, one of the two nontidal sites, Nonnative vegetation appeared in addition to Other Native vegetation, but accounted only for one third of the total vegetation. Conversely, on the other nontidal site, Berryessa d/s of Montague, there was a transition from both Other Native and Nonnative vegetation to only Other Native vegetation. The San Tomas tidal site changed from dominance by Other Native and Nonnatives to dominance solely by California bulrush. This vegetation type retained subcomponents of Other Native and Nonnative vegetation. Sunnyvale East had no dominance or quality changes.

Berryessa Creek June and September 1999 Comparison

Vegetation dominance and amount of wetland vegetation present varied on the Berryessa Creek d/s of Montague site between late June and mid-September. Because September 1998 data was used to compile 1998 results, September 1999 data was used to compile 1999 summary and comparative Adjacent Reference Site results. The amount of wetland present in September was approximately 175% of that present in June (0.37 ac and 0.21 ac). The vegetation was dominated by Nonnatives in June and by Other Natives in September. The dominance shift and expansion in area were both due primarily to the late-season growth of water cress (*Rorippa naturtium-aquaticum*) in the low-flow channel below the first railroad crossing, where the bed was kept wet throughout the summer by discharge from an outfall pipe.

GENERAL REFERENCE SITES

The results of the 1999 assessments for the General Reference Sites are summarized in Table 14); checklists and site photographs are located in Appendices D and G. As in 1997 and 1998, nontidal wetlands comprised Other Native, Cattail, and Nonnative-dominated vegetation. Total wetland per site ranged from 0 to 7,220 sq ft. As in 1997 and 1998, all but one tidal site consisted solely of Other Native-dominated wetlands. The remaining site, Guadalupe River, was dominated by Other Natives, with the Cattail/bulrush mix that was dominant the prior year, still present but accounting for only about 10% of the wetland on site. As in 1998, the Guadalupe site was by far the largest site with almost 80% of the total General References Sites' wetland acreage.

Wetland Acreage

Total wetland present in all General Reference Sites in 1999 was 91% of that present in 1998 (Table 15). Nontidal and tidal wetland amounts in 1999 were 105% and 90% of the 1998 values, respectively. Nontidal wetland amounts in both 1998 and 1999 were approximately 70% to 75% of that found in 1997. The total amounts of nontidal and tidal wetland in 1999 were 13,860 sq ft (0.32 ac) and 129,185 sq ft (2.96 ac), respectively.

Table 14. General Reference Sites: Summary of 1999 Assessments

Site	Month Surveyed[1]	Wetland Area (sq ft)	Wetland Area (acres)[2]	Vegetation Dominance Type[3]	Vegetation Quality Indicators[4]
Non-tidal					
Berryessa u/s Los Coches Avenue	Oct.	1502	0.03	Other Native	CBA
East Little Llagas	Oct.	0	0.00	---	---
Fisher	Oct.	1300	0.03	Cattail[5]	AAA
Greystone	Oct.	425	0.01	Other Native	CBA
Lower Silver	Oct.	1680	0.04	Cattail	ABA
Norwood	Oct.	440	0.01	Other Native	ABA
Smith	Oct.	333	0.01	Nonnative	ACA
Tularcitos	Oct.	7220	0.17	Other Native	AAA
West Little Llagas u/s Cosmo Avenue	Oct.	0	0.00	---	---
West Little Llagas d/s Main Avenue	Oct.	960	0.02	Cattail	AAA
Non-tidal Total		**13860**	**0.32**		
Tidal					
Guadalupe River	Sept.	112,124	2.57	t-Other Native	BBB
		12,458	0.29	t-Cattail/Bulrush mix	AAA
Site total		**124,582**	2.86		
San Francisquito	Nov.	930	0.02	t-Other Native	AAA
Stevens	Nov.	75	<0.01	t-Other Native	ABA
Sunnyvale West	Oct.	3598	0.08	t-Other Native	CBA
Tidal Total		**129,185**	**2.96**		
Total		**143,045**	**3.28**		

[1] All surveys were field measured except Guadalupe which used aerial photo

[2] Numerical discrepancies can be accounted for due to the rounding of values.

[3] Vegetation Dominance Type t = tidal

[4] See Table 5: Vegetation Quality Indicators

[5] "Cattail" in the nontidal sites was the dominant species in the "Cattail, Bulrush, Burreed, or mix" category.

Table 15. General Reference Sites: Comparisons of 1997-1999

	Wetland Area (sq. ft.)			Change From			Wetland Area (%)			Acreage Change Direction			1998-1999	
Site	1997	1998	1999	1997-1998	1998-1999	1997-1999	1998 compared to 1997	1999 compared to 1997	1999 compared to 1998	1997-1998	1998-1999	1997-1999	Change in Vegetation Dominance Status	Vegetation Quality Changes
Non-tidal														
Berryessa u/s Los Coches Avenue	2365	789	1502	-1576	713	-863	33	64	190	-	+	-	none	ABA to CBA
East Little Llagas	0	0	0	0	0	0	N/A	N/A	N/A	=	=	=	---	---
Fisher	1300	1300	1300	0	0	0	100	100	100	=	=	=	none	none
Greystone	44	965	425	921	-540	381	2193	966	44	+	-	+	none	BBA to CBA
Tularcitos	7980	6750	7220	-1230	470	-760	85	90	107	-	+	-	none	none
Lower Silver	720	1575	1680	855	105	960	219	233	107	+	+	+	Nonnative to Cattails	ACA to ABA
Norwood	5304	0	440	-5304	440	-4864	0	8	N/A	-	+	-	no wetland to Other Native	no wetland to ABA
Smith	0	360	333	360	-27	333	N/A	N/A	93	+	-	+	none	none
West Little Llagas u/s Cosmo Avenu	100	447	0	347	-447	-100	447	0	0	+	-	-	Other Native to no wetland	ABA to no wetland
West Little Llagas d/s Main Avenue	960	960	960	0	0	0	100	100	100	=	=	=	none	none
Nontidal Total	**18773**	**13146**	**13860**	**-5627**	**714**	**-4913**	**70**	**74**	**105**					
Tidal														
Guadalupe River[3]	138,956	138,956	124,582	0	-14,374	-14,374	100	90	90	=	-	-	Cattail/bulrush mix to Cattail/bulrush mix and Other Native	AAA to AAA and BBB
San Francisquito	no data	1040	930	N/A	-110	N/A	N/A	N/A	89	N/A	-	N/A	none	none
Stevens	no data	650	75	N/A	-575	N/A	N/A	N/A	12	N/A	-	N/A	none	none
Sunnyvale West	no data	3520	3598	N/A	78	N/A	N/A	N/A	102	N/A	+	N/A	none	BAA to CBA
Tidal Total[4]	--	**144,166**	**129,185**	--	**-14,981**	--	--	--	**90**					
Grand Total[4]	--	**157,312**	**143,045**	--	**-14,267**	--	--	--	**91**					

[1] See Table 5: Vegetation Quality Indicators

[2] "Cattails" in the nontidal sites were the dominant species in the "Cattail, Bulrush, Burreed, or mix" category.

[3] 1997 and 1998 Guadalupe mapped wetland were re-measured with plainimitry and corrected values presented in 1999.

[4] Data totals not presented for tidal area in 1997 due to incomplete data set. Several areas were not surveyed until 1998.

From 1998 to 1999, wetland amounts remained the same on three of the ten nontidal General Reference Sites; these were the same three sites on which wetland amounts were unchanged from 1997 to 1998. The remaining seven sites all changed from 1998 to 1999, with wetland amounts increasing on three sites and decreasing on four. On six of these seven sites, the direction of change in wetland amounts was in the opposite direction from the change of the year before. The sites with acreage changes had, in 1999, from 44% to 190% of the vegetation present in 1998.

From 1998 to 1999, tidal wetland amounts decreased on three and increased on one site. Twelve to 102% of the vegetation present in 1998 was present in 1999.

Vegetation Dominance and Quality

On seven of the ten nontidal sites, there was no change in vegetation dominance in1999 (this includes one site with no vegetation in 1997, 1998, or 1999, Table 15). Vegetation quality indicators changed on only three sites that were vegetated in both years. On two sites (Berryessa u/s Los Coches and Greystone), vegetation dominance remained the same but quality indicators changed due to a decrease in total percent cover of vegetation. On one site (Lower Silver), the vegetation dominance changed from dominance by Nonnatives to dominance by Cattails (both a vegetation dominance and quality indicator change). One site (Norwood) changed from no wetland to vegetated by Other Natives, while another (West Little Llagas u/s Cosmo) changed from Other Native vegetation to no wetland. Six of the eight vegetated sites have total cover in the highest category (76% to 100%), the other two were in Category C (25% to 50%). Invasive species cover was within the lowest category for all sites.

On two of the four tidal sites there was no change in either vegetation dominance or quality in 1999 (Table 15). The third site (Sunnyvale West) had the same vegetation dominance, but a slight decrease in total percent cover of vegetation. On the fourth site (Guadalupe River), Cattail/bulrush mix was still present as in 1997 and 1998, but most of the site was vegetated with Other Native vegetation. Cover of vegetation and of natives was barely over 50%, rather than nearly 100%.

DISCUSSION

SUMMARY FINDINGS

1997 Project Excavation Sites: Preproject, First and Second Year Postproject Comparisons

Overall wetland regrowth increased from 45% in 1998 to 67% in 1999, and wetland amounts on all but one of the eight 1997 Project Excavation Sites (North Morey Channel) increased from 1998 to 1999 (Tables 7 and 16). Continued regrowth on nontidal sites brought the total nontidal wetland amount nearly to the preexcavation level, increasing from 65% to 98% from 1998 to 1999. By contrast, the total wetland amount for the two nontidal sites increased little over the year, from 21 to 29 percent. As in 1997, seven of the eight sites (tidal and nontidal) showed marked regrowth compared to preproject values. Regrowth amounts on these sites ranged from about 40% to over 400% on one site (as seen last year, this same site had very little vegetation overall, so the high percentage indicates only a small increase in wetland area); three of these sites had as much or more wetland than prior to excavation.

As in 1998, only one site, San Tomas Aquino (tidal), displayed little regrowth (Table 7, Figure 3). Presumably, sedimentation on this site has not yet increased to an elevation high enough to support marsh vegetation. Vegetation on the other tidal site, Lower Penitencia, has increased each year, and has expanded toward the previously-excavated area in the middle of the west channel (Figure 4). Saratoga Creek (nontidal) provides an example of a site on which wetland area now exceeds that present prior to excavation. As in 1997 and 1998, wetland vegetation grew across the entire channel bottom throughout most of the site, including the depressed maintenance road (Figure 5).

The North Morey Channel was the only site at which vegetation amount declined between years, with a decrease from 64% regrowth to 41% from 1998 to 1999. About half of this decline can be directly accounted for by disturbance of the site due to bridge construction (Table 8). Even without this extenuating circumstance, this site has the lowest regrowth rate of any nontidal site. Water depth was generally >1M in unvegetated portions of the site, but only about 20 cm deep or less in the vegetated portions. Greater water depth may account for the lower regrowth amount here. Bridge construction is estimated to have decreased wetland amounts up to 0.06 ac on each of three study sites (North Morey and South Morey Excavation Sites, and the South Morey Adjacent Reference Site, Table 8).

In 1998, half of the eight 1997 Excavation Sites had almost no change between preproject and postproject vegetation dominance type or quality indicators. From 1998 to 1999, the vegetation characteristics remained unchanged on just two sites (Jones and San Tomas nontidal). Changes on the other sites consisted of:

- Slight shifts (generally not more than one category in magnitude) in vegetation quality indicators within a vegetation dominance type. These mostly consisted of increases in total vegetation cover or relative cover of natives (e.g., Los Coches, North Morey)

Table 16: Summary of 1997-99 Wetland Vegetation Regrowth Acreage Results

	1999 Regrowth (ac)	Regrowth Compared with Removal (%)		1999 Amount (ac)	1998 to 1997 (%)	1999 to 1998 (%)
		1998	1999			
1997 Excavation						
Nontidal	**3.4**	**65**	**98**			
Tidal	0.8	21	29			
Total	4.2	45	67			
1998 Excavation						
Nontidal	**2.7**	**N/A**	**133**			
Tidal	1.9	N/A	69			
Total	4.6	N/A	96			
1997 Adjacent Reference						
Nontidal				**1.7**	**N/A**	**112**
Tidal				3.5	N/A	118
Total				5.2	N/A	116
1998 Adjacent Reference						
Nontidal				**0.5**	**N/A**	**353**
Tidal				2.0	N/A	123
Total				2.5	N/A	143
General Reference						
Nontidal				**0.3**	**70.0**	**105**
Tidal				3.0	N/A	90
Total				3.3	N/A	91

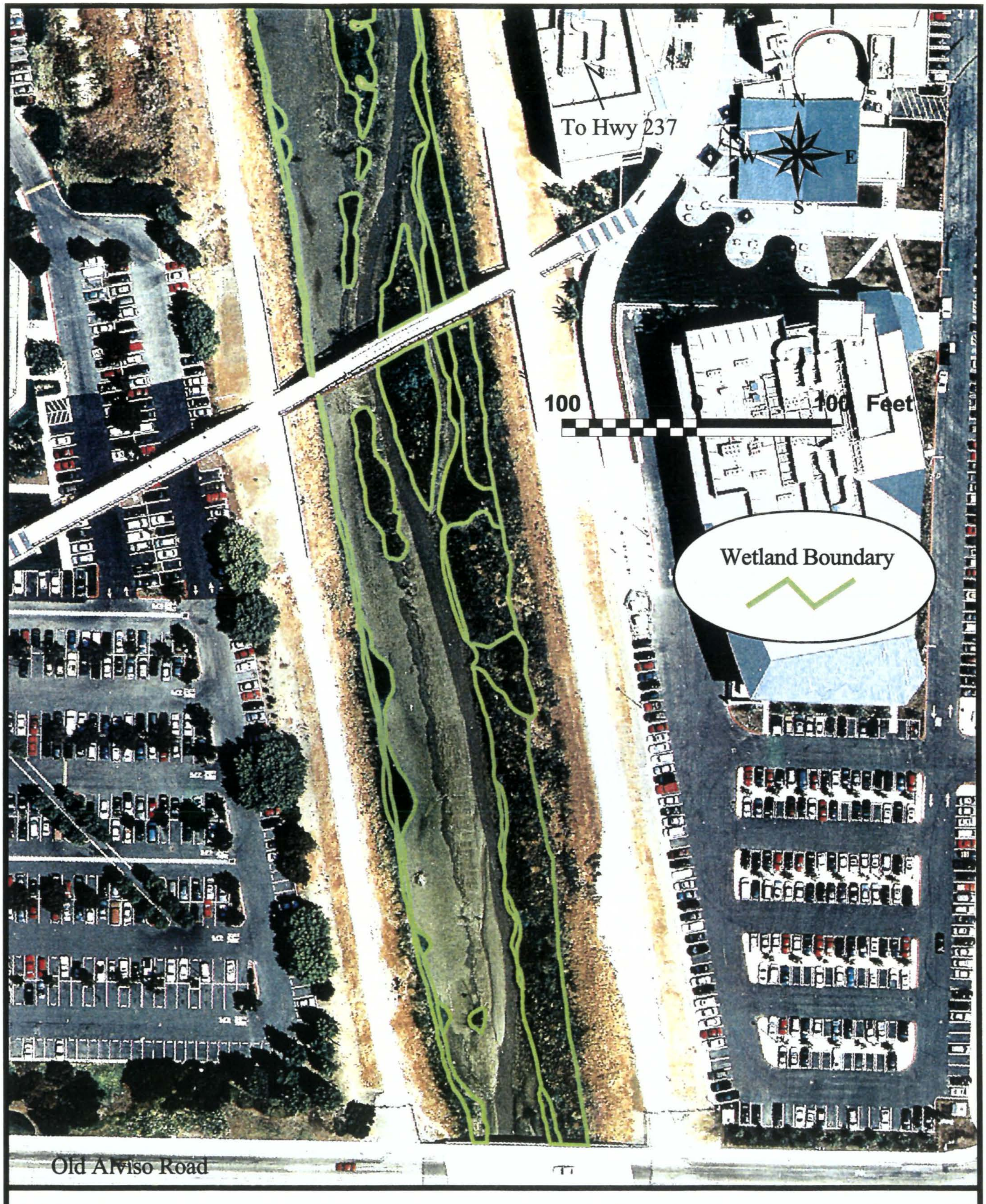

FIGURE 3. San Tomas Aquino Creek (Tidal) Excavation Site U/S Highway 237. 2nd Year Postproject Wetlands, Summer 1999 (Photo: August, Field Survey: September). Aerial View D/S of Old Alviso Road.

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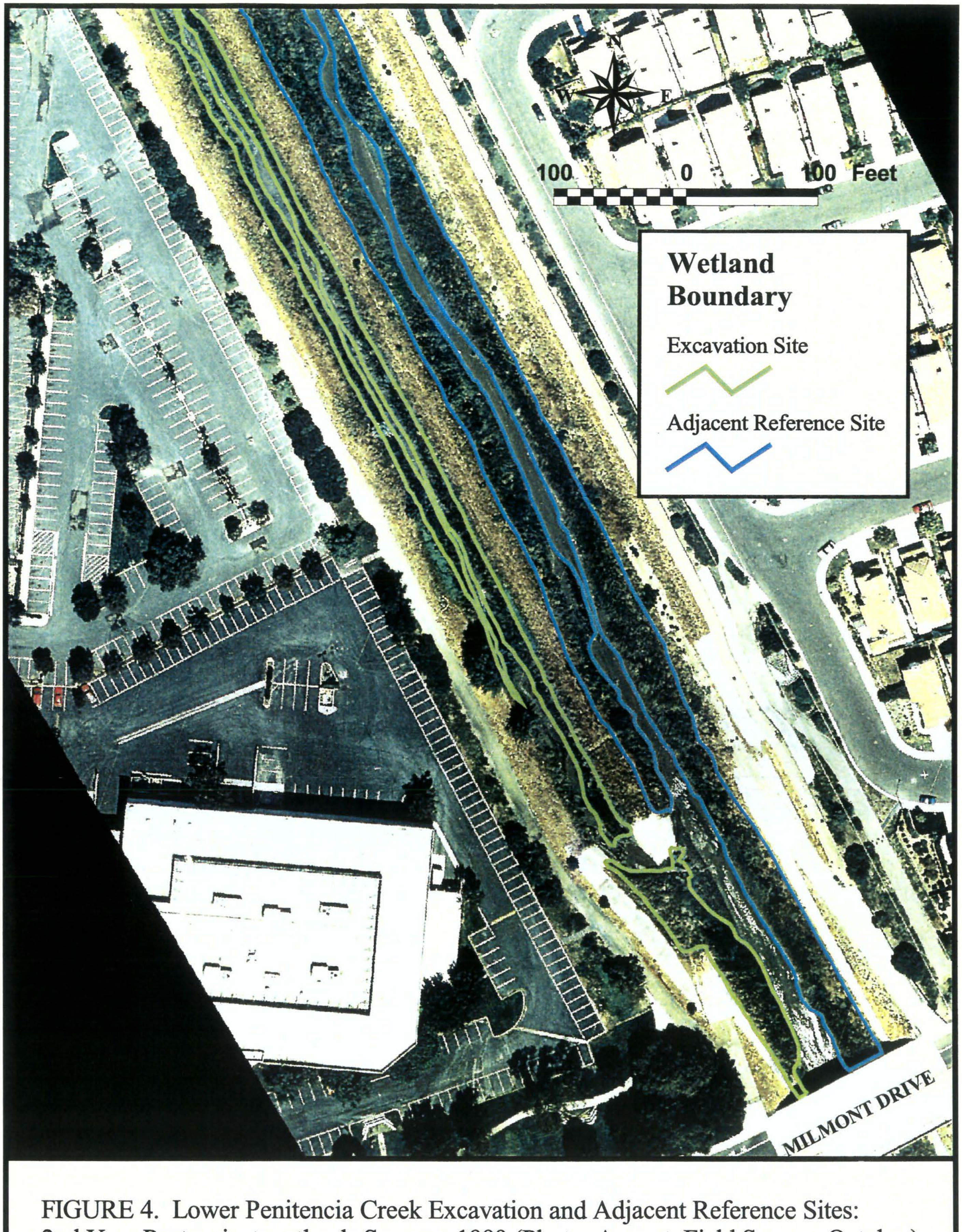

FIGURE 4. Lower Penitencia Creek Excavation and Adjacent Reference Sites: 2nd Year Postproject wetlands Summer 1999 (Photo: August, Field Survey: October). Aerial View D/S of Milmont Drive.

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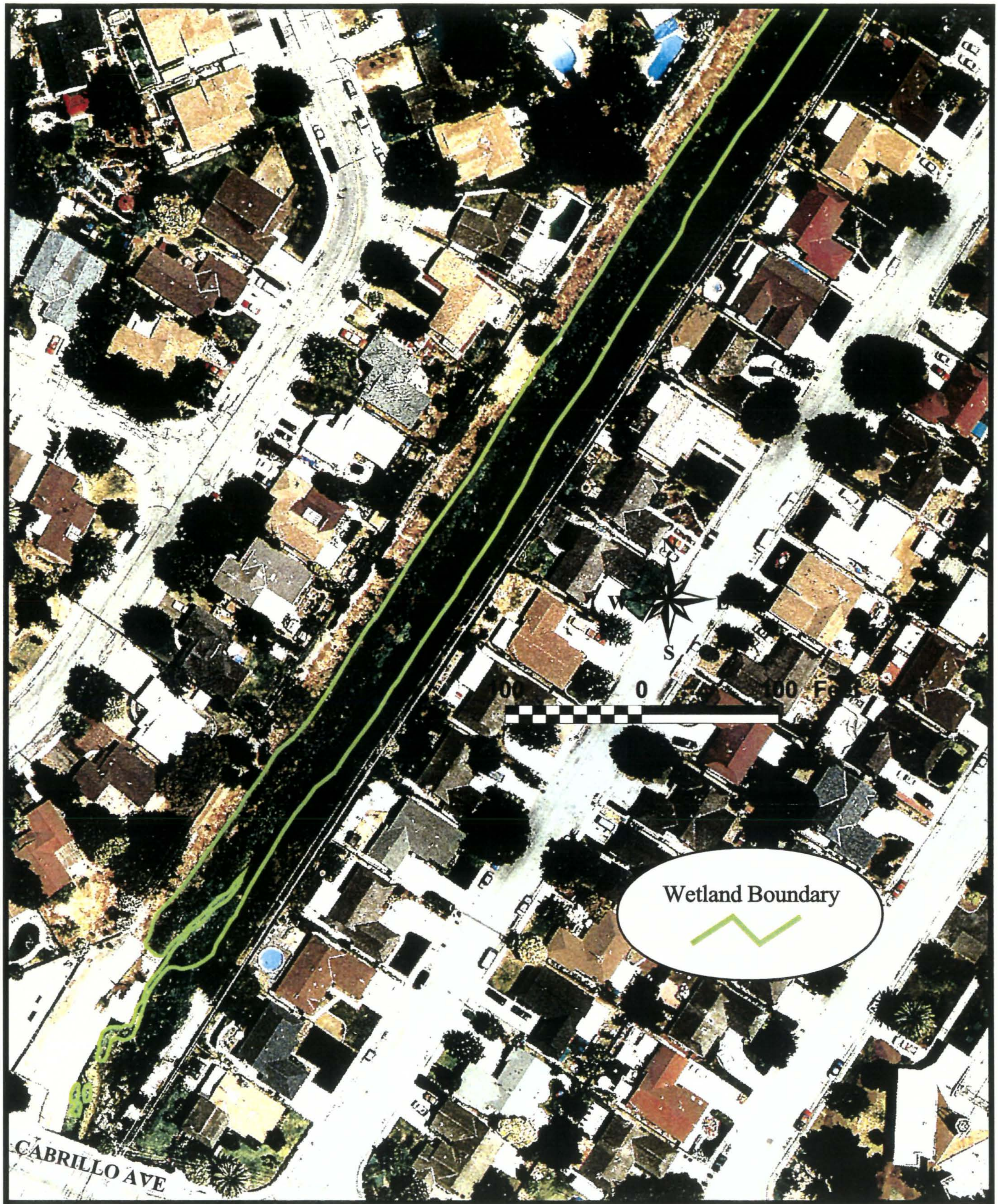

FIGURE 5. Saratogra Creek Excavation Site: Preproject Wetlands, Summer 1999 (Photo: August, Field Survey: September). Aerial View D/S of Cabrillo Ave.

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- Shifts in the proportion of the site occupied by previously-occurring vegetation dominance types, usually resulting in greater prevalence of a native vegetation type (e.g., Los Coches, South Morey)

- Disappearance of a nonnative vegetation type that was previously present (e.g., Lower Penitencia, San Tomas [tidal])

- Occurrence of a native-dominated vegetation type not previously present (e.g., Saratoga).

Most of these changes comprise shifts that are either neutral or positive in terms of vegetation quality. The exception is the increase in the amount of invasive exotic species cover due to the presence of broad-leaf peppergrass (*Lepidium latifolium*) on the tidal Lower Penitencia site. The vegetation on Lower Penitencia comprises both remnant and regrowth vegetation. The upland levee slopes of the site support dense peppergrass stands, but little peppergrass has been noted in the wetland previously. The distribution of the peppergrass does not appear to be differentially distributed between the remnant and regrowing areas.

Compared to preexcavation, in 1999 one site had exactly the same vegetation dominance on the entire site as before. Five sites supported the same vegetation dominance category as prior to excavation plus an additional type; one site, North Morey, supported none of the original vegetation type; and the preexcavation dominance of one site is unknown. The additional vegetation types comprised Other Natives on three sites (including both Morey Channels) and Cattails on two. These included one shift in vegetation from Nonnatives to Other Natives, two shifts from Other Natives to Cattails, and two shifts from Cattails to Other Natives. Vegetation cover was in the highest category for all vegetation types, and invasive cover was in the lowest cover category for all, with the exception of Lower Penitencia, as described above.

North Morey was distinguished by having the most dramatic vegetation shift since 1997. Both North and South Morey Channels converted from Cattail-dominated, almost monotypic wetlands prior to excavation, to Other Native-dominated wetlands in 1998. North Morey vegetation dominance type and quality indicators were the same in 1999 as in 1998, with only Other Native-dominated vegetation present. On South Morey, both Other Native and Cattail-dominated vegetation were present, as in 1998; however, the Cattail-dominated vegetation expanded to account for approximately half of the vegetation in 1998.

1998 Project Excavation Sites: First Year Postproject Regrowth

First year postproject regrowth results for the 1998 Excavation Sites were similar to the first year results for the 1997 sites in that all sites, except for one tidal site, showed appreciable regrowth (Tables 9 and 10). Overall, there was approximately 96% regrowth of the preproject wetland acreage removed in 1998. This amount exceeds the regrowth amount seen overall in both the first and second postproject years for the 1997 sites (Table 16). The regrowth amounts for nontidal and tidal reaches, 133% and 69%, respectively, were each also higher than both the first and second year regrowth amount for the 1997 sites.

Three of the five sites (two nontidal and one tidal) showed marked regrowth in excess of preexcavation levels. Of the remaining tidal sites, one had approximately 50% regrowth and another (Sunnyvale East) had almost none. Sunnyvale East had probably not accumulaged sediment to an elevation that supports wetland plant establishment.

Regrowth within the Berryessa Creek u/s of Lower Penitencia Creek site (nontidal reach) is illustrated in Figure 6. Alternate sides of Berryessa Creek were excavated in 1997 and 1998. The figures show the post-1997 excavation/pre-1998 excavation condition just d/s of Milpitas Boulevard in summer 1998 and the immediate and first year post-1998 excavation conditions. Similar wetland vegetation types were present in both years, but vegetation distribution quickly responded to the topographic and hydrologic changes that resulted from excavation. Patches of Other Native-dominated wetland occupied the most recently excavated side of the channel. The adjacent bench on the opposite side (north in 1998, south in 1999) supported a more continuous stand of drier, Nonnative-dominated wetland.

Each study site supported some vegetation similar in dominance and quality to that present in 1998. Each site also experienced some changes in either vegetation dominance or quality (Table 10). As in the 1997 Excavation Sites, the changes seen in vegetation dominance or quality categories were mostly positive or neutral. These changes included the appearance of new native-dominated vegetation categories previously not present and higher relative percent cover of natives in a preexisting vegetation type.

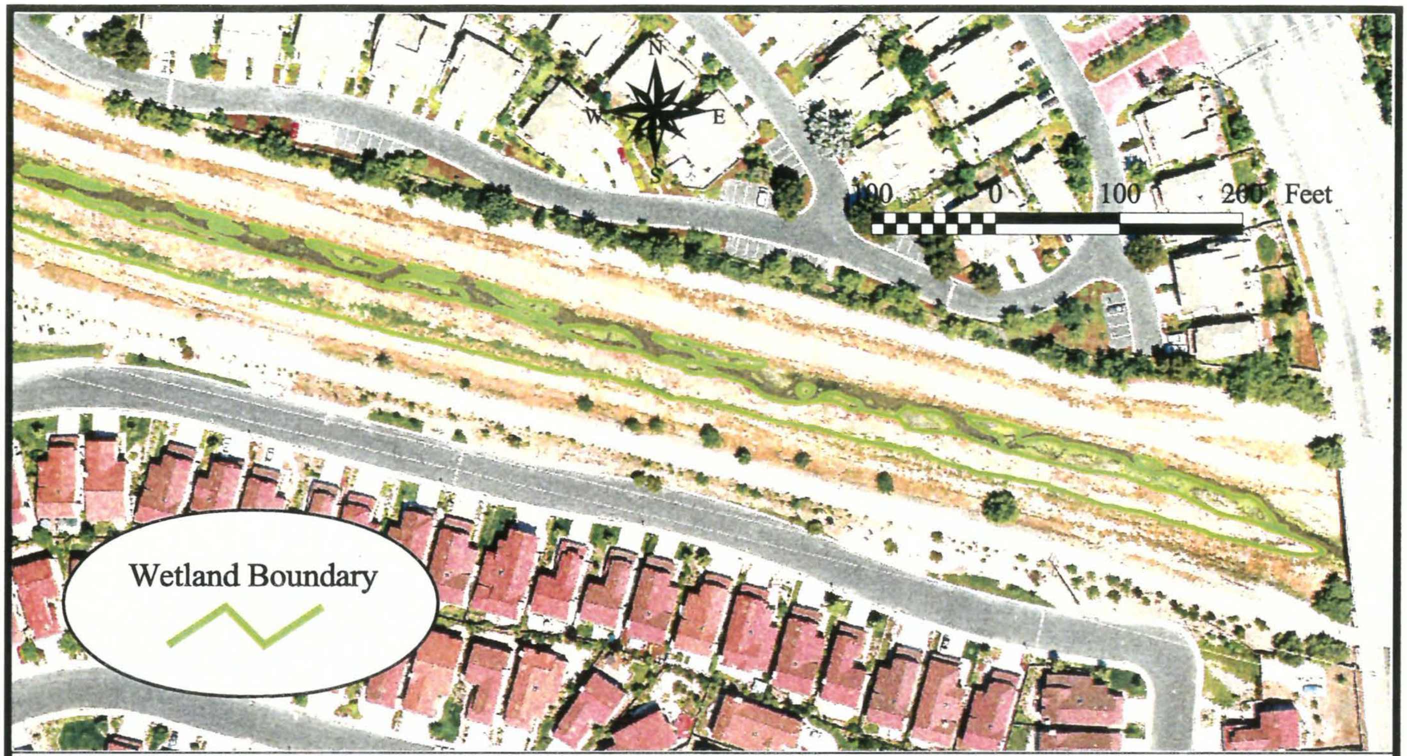
A shift in wetland acreage and quality occurred on Berryessa u/s of Lower Penitencia (nontidal). The site supported more wetland in 1999 than 1998, but the increase was due to an increase in the amount of Nonnative vegetation. While the amount of native vegetation was comparable between years, and cattails were present within site wetlands, Cattail-dominated vegetation was no longer present. In 1998, the Cattail-dominated vegetation was located on a high, dry bench several feet above the summer water level, and the cattails' stems were prematurely senescent. It appeared that, likely due to sedimentation, the bench was too high to support the hydrology required to sustain this obligate wetland species. The bench and cattails were excavated in 1998.

COMPARISON OF EXCAVATION AND REFERENCE SITES

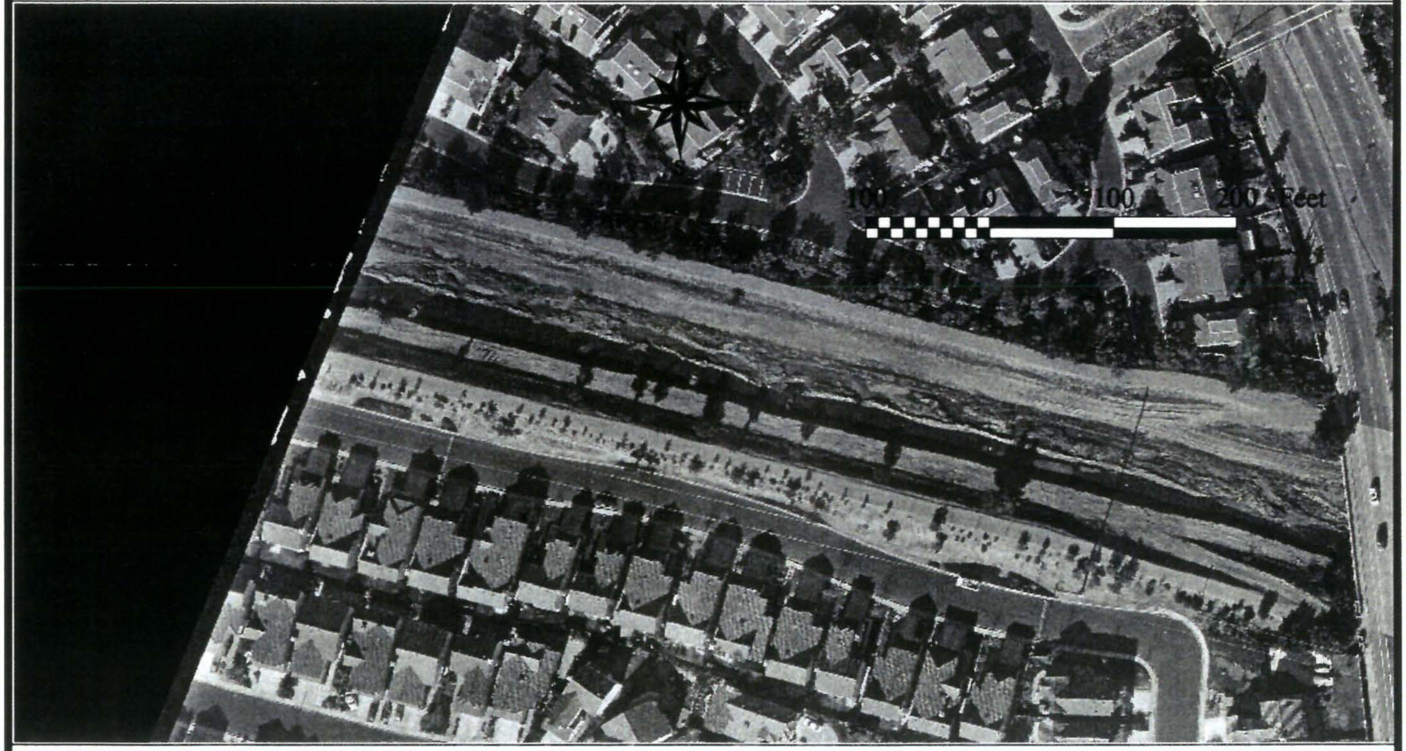
Percentage increase or decrease comparisons between Excavation, Adjacent Reference, and General Reference Sites should be viewed as directional trend indicators rather than quantitative certainties. Sizeable differences in overall magnitude of acreage sampled in each category makes strict quantitative comparisons potentially misleading. For example, over five times the acreage of wetland was present in the 1998 Excavation Sites than in the 1998 Adjacent Reference Sites, and a small increase in overall acreage on the Reference Sites resulted in a large increase in percentage growth.

1997 Adjacent Reference Sites

Total wetland amounts in both the 1997 Excavation and Adjacent Reference Sites increased overall. Increases also occurred in both the tidal and nontidal categories from 1998 to 1999 (Table 16). The increase over this period was greater for the nontidal Excavation Sites than for the nontidal Adjacent Reference Sites (approximately 50% versus 12%, respectively), and similar for the tidal sites (approximately 10% to 15%).



6A. Post-1997 and Pre-1998 Excavation, Summer 1998 (Photo: August).



6B. Post-1998 Excavation, Winter 1999 (Photo: January).

FIGURE 6. Berryessa Creek Excavation Site:
Aerial View D/S of Milpitas Blvd.

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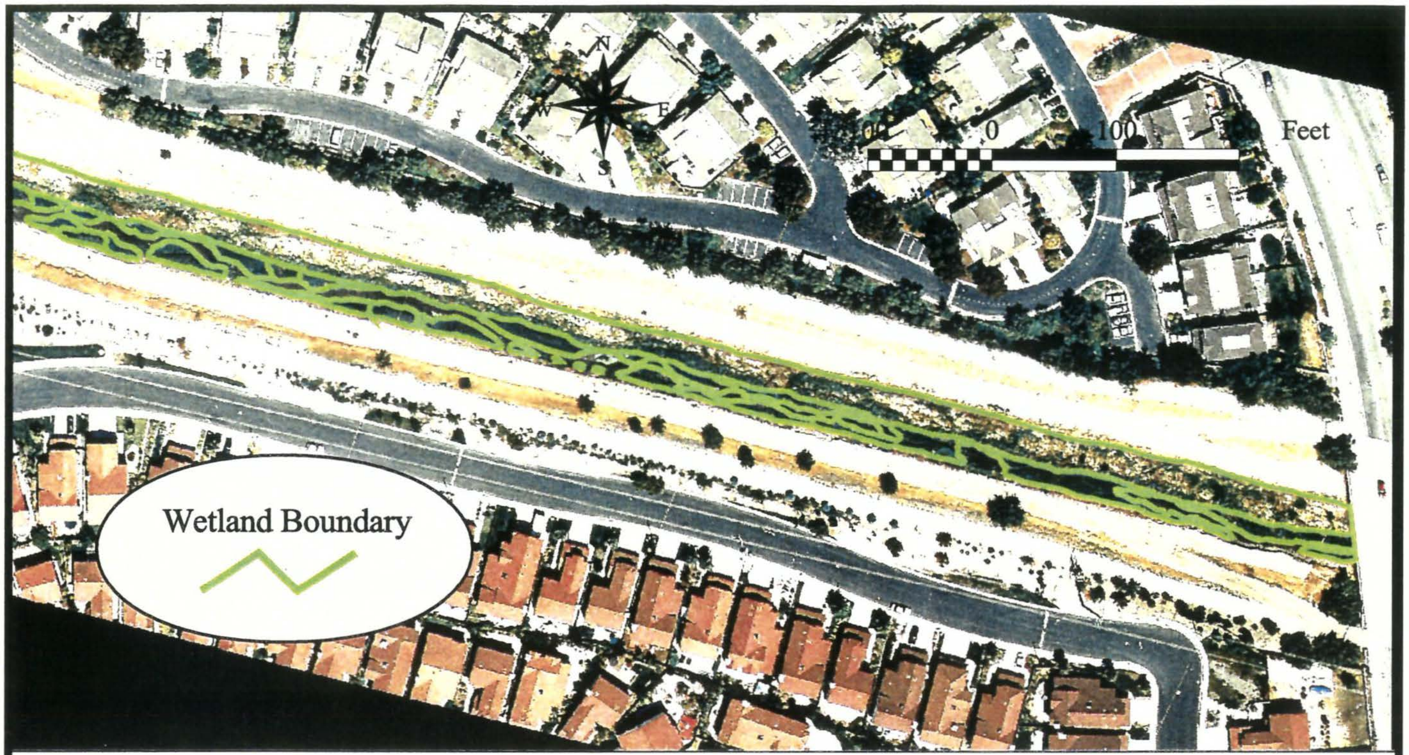

6C. Post-1998 Excavation, Summer 1999 (Photo: August).

FIGURE 6 (continued). Berryessa Creek Excavation Site:
Aerial View D/S of Milpitas Blvd.

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Only two of the six 1997 Adjacent Reference Sites had no change in either vegetation dominance or quality from 1998 to 1999 (Table 12). This is comparable with the results from 1997 Excavation Sites (Table 7). Two of the four neutral or positive changes that occurred on the 1997 Excavation Sites also occurred on four reference sites. These were:

- Slight shifts in vegetation quality indicators within a vegetation dominance type. These consisted of increases in total vegetation cover or relative cover of natives.
- Occurrence of a native-dominated vegetation type not previously present.

Other than the occurrence of a small amount of nonnative wetland on one site, no potentially negative trends in vegetation dominance or quality were noted on the 1997 Adjacent Reference Sites. The only apparent negative change on the 1997 Excavation Sites was the increase in invasive species cover (one cover category up) on one site.

1998 Adjacent Reference Sites

Total wetland amounts in both nontidal and tidal 1998 Adjacent Reference Sites increased from 1998 to 1999 (353% and 123%, respectively, Table 16). Nontidal wetland amounts in 1998 Excavation Sites were also greater in 1999 than they were prior to excavation in the 1998 Excavation Sites (133%). There was a sizeable amount of regrowth (60%) overall in tidal sites but this constitutes a decrease compared to the preproject condition.

Some changes in vegetation dominance occurred on three of the four 1998 Adjacent Reference Sites and three of five 1998 Excavation Sites (Tables 10 and 13). Vegetation quality indicators changed on one of four Reference Sites and four of five Excavation Sites. These changes were mostly neutral or positive, as described above. One of each of the following three types of dominance changes occurred on both Excavation and Reference sites: (1) potentially positive (e.g., appearance of new native vegetation, disappearance nonnative); (2) potentially neutral (e.g., disappearance of one native vegetation type with the appearance of another); and (3) potentially negative (e.g., disappearance of native vegetation type, appearance or increase in amount of nonnative vegetation). The potentially negative change (the loss of cattail-dominated vegetation) on a portion of one nontidal 1998 Excavation Site (Berryessa u/s of Lower Penitencia) was similar to the change which occurred on the 1997 Morey Channel sites in the first postproject year. The 1997 nontidal Adjacent Reference Sites had no Cattail-dominated vegetation in either year.

General Reference Sites

Unlike either the 1997 or 1998 Excavation or Adjacent Reference Sites, the total amount of wetland present on the General Reference Sites declined slightly from 1998 to 1999 (Tables 15 and 16). This was due primarily to the decline in vegetation amount on the Guadalupe River tidal site. This site is much larger than all other General Reference Sites, and thus swamps the total sums.

Overall nontidal wetland amounts were approximately the same in 1999, at 105% of the 1998 value, and the 1999 tidal was approximately 90% of the 1998 value. Although overall wetland amounts were similar from 1998 to 1999, they fluctuated both up and down on 11 of the 15 sites.

The direction of change in wetland amount on many of these sites was opposite that seen from 1997 to 1998.

Half of the sites had no changes in vegetation dominance or quality. Changes that did occur were similar to those that occurred on other Excavation and Adjacent Reference Sites, including a decrease in total percent cover (more prevalent here than on other sites) and a shift from one native vegetation type to another. In addition, two changes were seen that were not observed in any of the Excavation or Adjacent Reference Sites: a site with no wetland became vegetated and wetland at another site disappeared due to lack of water.

COMPARISON OF RESULTS TO DISTRICT WETLAND MITIGATION REQUIREMENTS

Permits for the District's 1997 Urgent Sediment Removal Projects require mitigation for impacts to 0.6 ac of nontidal and 8.9 ac of tidal wetlands. The amount of this wetland within the 1997 Excavation Sites was 0.39 ac nontidal and 4.08 ac tidal (Table 17, Note: 1.77 additional acres were on Berryessa, considered a 1998 site in this Study, and 2.6 additional acres were in the 1998 San Tomas [tidal] Excavation Site). These amounts are based on the assessments used for the 1997 Sediment Removal Project permits and environmental documents (TRA 1995 and 1997) and do not include the 1997 reassessments or corrections used for this comparative study (see Methods Section, Rankin and Hillman 1999). Addenda to the 1997 Sediment Removal Project permits identified additional work and impacts, which are to be considered when formulating mitigation for the long-term program. These are also presented in Table 17.

This comparison is intended to relate permit obligations to the amount of wetland present during the latter part of the growing season 1 and 2 years following the impacts. Wetland impacts, as determined for the Study baseline versus the 1997 permits, were higher in the 1997 permit nontidal sites and lower in the 1997 permit tidal sites and long-term program nontidal sites (Table 17). The amount of wetland regrowth in 1998 compared with impacts presented in the 1997 permits was approximately 300%, 15%, and 48% in the 1997 permit nontidal sites, 1997 permit tidal sites and long-term program nontidal sites, respectively; and 104%, 21%, and 67% as compared to the Study baseline. The amount of regrowth in1999 compared with impacts per the 1997 permits was approximately 340%, 20%, and 54%, respectively; and 117%, 27%, and 75% as compared to the Study baseline.

VEGETATION MANAGEMENT

Vegetation management is a significant component of the District's flood management maintenance program. Most Excavation and Reference Sites in this Study are subject to routine vegetation management. In north county, vegetation management within the stream channels comprises primarily herbicide treatment; in south county it consists of hand removal of vegetation. The routine type of vegetation management indicated for each Study site, and any deviations known during the duration of the Study, is shown in Appendix I (Mark Wander, personal communication).

Table 17. 1997 Project Excavation Sites: Comparison of 1999 Wetland Regrowth with Impacts Determined for 1997 Sediment Removal Project Permits and for 1997 Study Baseline (1999).[1,2]

Site	Wetland Impacts per 1997 Permits (acres)	Wetland Impacts per 1997 Preproject Study Baseline (acres)	Wetland Regrowth in 1998	Wetland Regrowth in 1999
Sites for which mitigation is required by 1997 permits				
Nontidal				
Los Coches	0.18	0.03	0.08	0.13
Saratoga	0.21	1.11	1.10	1.20
Total impact for which mitigation required per 1997 permit	0.39			
Total impact per 1997 baseline		1.14		
Peak wetland regrowth in 1998			1.18	
Peak wetland regrowth in 1999				1.33
Tidal				
Lower Penitencia[3]	1.45	0.96	0.50	0.64
San Tomas (tidal) u/s Highway 237[4]	2.63	1.90	0.10	0.18
Total impact for which mitigation required per 1997 permit	4.08			
Total impact per 1997 baseline		2.86		
Peak wetland regrowth in 1998			0.60	
Peak wetland regrowth in 1999				0.82
Sites on which mitigation is required to be determined as part of the long-term program (all nontidal)				
Jones	0.43	0.40	0.23	0.34
North Morey	0.80	0.39	0.25	0.16
San Tomas (non-tidal) u/s Central Expressway (Walsh to railroad segment)[5]	0.20	0.20	0.10	0.24
South Morey	0.40	0.33	0.21	0.25
Total impact to be included with long-term program mitigation	1.83			
Total impact per 1997 baseline		1.32		
Peak wetland regrowth in 1998			0.79	
Peak wetland regrowth in 1999				0.99

[1] Acreage reported to nearest 0.01 as in 1997 permit documents.

[2] Numerical discrepancies can be accounted for due to the rounding of values.

[3] Excavation Site is portion of larger Project Site.

[4] 5.27 ac in 1997 Excavation Site according to 1995 maps. (1/2 of wetland projected to be removed.)

[5] No mitigation required for San Tomas U/S Central Expy (Central to Walsh segment).
{The figures for this site are 0.02 ac, 0.96, and 0.25 ac in 1995, 1997 and 1998.}

Although a reach is indicated for treatment on a routine basis, treatment may or may not be done within a specific reach in any particular year, depending on conditions found. When a reach is treated, the percentage of area treated within the reach also varies depending upon conditions. Aquatic herbicide application and hand removal target woody plants and tall emergent herbs such as cattails; however, on some sites, lower growing herbaceous vegetation may also be removed.

Vegetation management has been ongoing before and during this Study. In general, aquatic herbicide work is conducted between July1 and October 15 and hand removal is conducted in December. In 1999, all vegetation management activities on Study sites were conducted after field assessments; the timing of vegetation management in prior years is not known.

Vegetation changes in 1999 on at least one site (Guadalupe River General Reference) appear to have resulted from prior vegetation management actions. This Study, however, does not document site-specific vegetation management actions or attempt to interpret effects of the vegetation management program. However, it is important to be aware that all Study data have been collected in the general context of ongoing vegetation management.

CONCLUDING REMARKS

Results of first and second year postproject surveys on 1999 Excavation Sites and first year surveys on 1998 sites indicated that substantial wetland vegetation regrowth occurred on most sites within 1 year after excavation and continued to increase in the second year. Nontidal wetlands amounts collectively approached or surpassed preexcavation amounts within 1 or 2 years after the excavation. Regrowth on individual tidal sites was generally lower than on nontidal sites, and some tidal sites experienced almost no regrowth within 1 or 2 years. Overall tidal regrowth was approximately ⅓ to ½ that seen in nontidal sites in the same year. There was no clear differentiation in the tendency for changes in vegetation dominance or quality to occur in Excavation Sites as compared to Reference Sites, with the exception of the initial reduction in tall perennial emergent vegetation (cattails) seen in certain nontidal Excavation Sites.

REFERENCES

Bonham, C. 1989. Measurement for Terrestrial Vegetation. John Wiley and Sons, New York.

Environmental Laboratory. 1987. "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Hickman, L. R., ed. 1993. The Jepson Manual: Higher Plants of California. University of California Press, Berkeley, CA.

H.T. Harvey and Associates. 1997. Lower Guadalupe River Santa Clara County Identification of Waters of the U.S. Alviso, CA.

Mueller-Dombois, D. and H. Ellenberg. 1975. Aims and Methods of Vegetation Ecology. John Wiley and Sons, new York.

Rankin, G.. and J. Hillman. 1998. Santa Clara Valley Water District Instream Wetland Vegetation Regrowth Study First Annual Report: Results For 1998. Santa Clara Valley Water District. San Jose, CA.

Reed, P. 1988. National List of Plant Species that Occur in Wetlands: California (Region 0). U.S. Fish and Wildlife Service Biological Report 88 (26.10).

Santa Clara Valley Water District. 1998. Santa Clara Valley Water District 1998 Stream Maintenance Project Final Initial Study and Negative Declaration. San Jose, CA.

Soil Conservation Service. 1968. Soils of Santa Clara County, California. USDA.

Soil Conservation Service. 1992. Hydric Soils in Santa Clara Area. USDA.

Thomas Reid Associates (TRA). 1995. Application for the Department of the Army Permit (33 CFR 325) Additional Information. Prepared for the Santa Clara Valley Water District. Palo Alto, CA.

Thomas Reid Associates (TRA). 1997. Santa Clara Valley Water District Urgent Sediment Removal Project Final Initial Study and Mitigated Negative Declaration. Palo Alto, CA.

Wander, Mark. Special Projects Unit, Santa Clara Valley Water District. Personal communication.

APPENDIX A
Study Plant List

Wetland Vegetation Regrowth Study Plant List for 1999

Family Name	Species	Common Name	Wetland Indicator Status [1, 2]	Origin[3]
ALISMATACEAE	*Alisma lanceolatum*	Water Plantain	OBL	E
AMARANTHACEAE	*Amaranthus retroflexus*	Rough Pigweed	FACU	E
APIACEAE	*Conium maculatum*	Poison Hemlock	FACW	E
	Foeniculum vulgare	Fennel	FACU	E
ASTERACEAE	*Artemisia douglasiana*	Mugwort	FACW	N
	Artemisia californica	California Sagebrush	UPL	N
	Aster subulatus var. ligulatus	Slim Aster	FACW	N
	Baccharis douglasii	Marsh Baccharis	OBL	N
	Baccharis salicifolia	Mule Fat	FACW-	N
	Bidens frondosa	Sticktight	FACW	N
	Centaurea solstitialis	Yellow Star Thistle	NOL	I
	Cirsium vulgare	Bull Thistle	FACU	E
	Conyza canadensis	Horseweed	FAC	N
	Cotula coronopifolia	Brass Buttons	FACW+	E
	Euthamia occidentalis	Western Goldenrod	OBL	N
	Gnaphalium luteo-album	Weedy Cudweed	FACW-	E
	Grindelia stricta	Gumplant	NOL	N
	Helenium puberulum	Sneezeweed	FACW	N
	Hemizonia sp.	Tar Plant	NOL	UNK
	Lactuca serriola	Prickly Lettuce	FAC	E
	Picris echioides	Bristly Ox-Tongue	FAC	E
	Sonchus oleraceus	Common Sow Thistle	NI	E
	Xanthium strumarium	Cocklebur	FAC+	E
BETULACEAE	*Alnus rhombifolia*	White Alder	FACW	N
BRASSICACEAE	*Brassica nigra*	Black Mustard	UPL	E
	Lepidium latifolium	Broad-Leaf Peppergrass	FACW	I
	Raphanus sativus	Wild Radish	UPL	E
	Rorippa nasturtium-aquaticum	Watercress	OBL	N
CAPRIFOLIACEAE	*Sambucus mexicana*	Blue Elderberry	FAC	N
CHENOPODIACEAE	*Atriplex triangularis*	Spearscale	FACW	N
	Beta vulgaris	Garden Beet	FACU	E
	Chenopodium ambrosioides	Mexican Tea	FAC	E
	Chenopodium sp.	Goosefoot	NOL	UNK
	Salicornia virginica	Pickleweed	OBL	N
	Salsola tragus	Russian Thistle	FACU	E
CONVOLVULACEAE	*Convolvulus arvensis*	Bindweed	NOL	E
CYPERACEAE	*Cyperus eragrostis*	Tall Cyperus	FACW	N
	Cyperus esculentus	Yellow Nutgrass	FACW	N
	Cyperus involucratus	Umbrella Nutsedge	OBL	E
	Scirpus sp.	Bulrush	NOL	UNK
	Scirpus californicus	California Bulrush	OBL	N
	Scirpus maritimus	Bulrush	OBL	N
	Scirpus pungens	Common Threesquare	OBL	N
	Scirpus robustus	Alkali Bulrush	OBL	N
EQUISETACEAE	*Equisetum arvense*	Common Horsetail	FAC	N
EUPHORBIACEAE	*Ricinis communis*	Castor Bean	FACU	E
FABACEAE	*Melilotus alba*	White Sweetclover	FACU+	E
	Melilotus indica	Sourclover	FAC	E
JUGLANDACEAE	*Juglans californica var. hindsii*	Northern California Black Waln	FAC	N
JUNCACEAE	*Juncus bufonius*	Toad Rush	FACW+	N
	Juncus xiphioides	Iris-Leaved Rush	OBL	N
LAMIACEAE	*Mellisa officinalis*	Bee Balm	NOL	E
	Mentha arvensis	Field Mint	FACW	E
	Mentha sp.	Mint	NOL	UNK

Wetland Vegetation Regrowth Study Plant List for 1999 (Continued)

Family Name	Species	Common Name	Wetland Indicator Status [1, 2]	Origin[3]
LAMIACEAE	*Mentha spicata*	Spearmint	OBL	E
	Mentha suaveolens	Mint	FACW	E
LYTHRACEAE	*Lythrum californicum*	California Loosestrife	OBL	N
MALVACEAE	*Malva sp.*	Mallow	NOL	E
MYRTACEAE	*Eucalyptus sp.*	Eucalyptus	NOL	E
ONAGRACEAE	*Epilobium sp.*	Willow-Herb	NOL	N
	Epilobium ciliatum ssp. cilatum	Common Willow-Herb	FACW	N
	Ludwigia peploides ssp. peploides	Yellow Water Primrose	OBL	N
PLANTAGINACEAE	*Plantago lanceolata*	English Plantain	FAC-	E
	Plantago major	Common Plantain	FACW-	E
PLATANACEAE	*Platanus racemosa*	Western Sycamore	FACW	N
POACEAE	*Agrostis sp.*	Bent Grass	NOL	E
	Agrostis viridis	Water Bent Grass	OBL	E
	Agrostis stolonifera	Creeping Bent	FACW	E
	Arundo donax	Giant Reed	FACW	I
	Avena sativa	Cultivated Oat	NOL	E
	Avena fatua	Wild Oat	NOL	E
	Avena sp.	Wild Oat	NOL	E
	Avena barbata	Slender Wild Oat	NOL	E
	Bromus diandrus	Ripgut Brome	NOL	E
	Bromus catharticus	Rescue Grass	NOL	E
	Cynodon dactylon	Bermuda Grass	FAC	E
	Digitaria sanguinalis	Crab Grass	FACU	E
	Echinochloa crus-galli	Barnyard Grass	FACW	E
	Eragrostis mexicana ssp. virescens	Lovegrass	FAC	N
	Holcus lanatus	Velvet Grass	FAC	E
	Leersia oryzoides	Rice Cutgrass	OBL	N
	Leptochloa fascicularis	Bearded Sprangletop	OBL	N
	Lolium multiflorum	Italian Ryegrass	NOL	E
	Paspalum dilatatum	Dallis Grass	FAC	E
	Paspalum distichum	Knot Grass	OBL	N
	Phalaris sp.	Canary Grass	NOL	UNK
	Phalaris aquatica	Harding Grass	FAC+	E
	Piptatherum miliaceum	Smilo Grass	NOL	E
	Polypogon interruptus	Ditch Beard Grass	OBL	E
	Polypogon monspeliensis	Annual Beard Grass	FACW+	E
	Sorghum bicolor	Sudan Grass	FAC	E
	Spartina foliosa	California Cordgrass	OBL	N
POLYGONACEAE	*Polygonum lapathifolium*	Willow Weed	OBL	N
	Polygonum spp.	Smartweed	NOL	N
	Polygonum punctatum	Water Smartweed	OBL	N
	Polygonum arenastrum	Common Knotweed	FAC	N
	Polygonum persicaria	Lady's Thumb	FACW	E
	Polygonum hydropiper	Marshpepper	OBL	E
	Polygonum amphibium var. emersum	Water Smartweed	OBL	N
	Polygonum hydropiperoides	Waterpepper	OBL	N
	Rumex crispus	Curly Dock	FACW-	E
PORTULACACEAE	*Portulaca oleracea*	Common Purslane	FAC	E
PRIMULACEAE	*Anagallis arvensis*	Scarlet Pimpernel	FAC	E
SALICACEAE	*Populus fremontii*	Fremont Cottonwood	FACW	N
	Salix lasiolepis	Arroyo Willow	FACW	N
	Salix sp.	Willow	NOL	N
	Salix laevigata	Red Willow	NOL	N
	Salix exigua	Narrow-Leaved Willow	OBL	N

Wetland Vegetation Regrowth Study Plant List for 1999 (Continued)

Family Name	Species	Common Name	Wetland Indicator Status [1, 2]	Origin[3]
SCROPHULARIACEA	*Mimulus guttatus*	Common Large Monkeyflower	OBL	N
	Veronica anagallis-aquatica	Water Speedwell	OBL	E
SOLANACEAE	*Solanum sp.*	Nightshade	NOL	E
TYPHACEAE	*Sparganium eurycarpum ssp. eurycarpum*	Broad-Fruited Bur-Reed	OBL	N
	Typha angustifolia	Narrow-Leaved Cattail	OBL	N
	Typha domingensis	Southern Cattail	OBL	N
	Typha latifolia	Broad-Leaved Cattail	OBL	N
	Typha sp.	Cattail	OBL	N
URTICACEAE	*Urtica dioica ssp. holosericea*	Hoary Nettle	FACW	N

[1] (Reed, 1998)

[2] WETLAND INDICATOR CATEGORY (PROBABILITY OF OCCURENCES IN WETLANDS):
Obligate (>99%), Facultative Wetland (67-99%), Facultative (34-66%), Facultative Upland (1-33%), Upland (<1%).
Not On List- NOL, NI- No Indicator Status Given

[3] N = Native, E = Exotic, I = Invasive Exotic, UNK=Unknown Origin

APPENDIX B
Excavation Site Checklists

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Jones Creek	**Survey Date**: 9/8/99
Project/Activity: 2nd year post-project survey: Excavation study site	**Investigator**: Janell Hillman
Location: from Hwy 152 to 930 ft d/s	Vegetation Type 1 of 2

If nontidal: Is water present in channel? yes
Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**
Maps or photos used: Yellow book map

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos Disc 6

Vegetation description:

This habitat type was dominated by *Polygonum* spp, especially *Polygonum punctatum* (with >50% relative cover). *Epilobium ciliatum* was sub-dominant, with 20-50% relative cover. *Atriplex triangularis* was also common. In general, vegetation was thick and no open water was visible. There were scattered individuals of *Typha latifolia* present. The invasive *Lepidium latifolium* was present in the wetland and at the upland fringe, but at cover values of less than 5%. In general, native species relative percent cover was quite high, with most weedy vegetation occurring in upland areas on the upper channel banks.

Estimated wetland amount: 8460 sq. ft, or 0.19 acre

SCVWD Wetlands Plant List

Facility Name:	Jones Creek	**Survey Start Date:**	9/8/99
Location:	from Hwy 152 d/s approx. 930 ft (to weir)	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Excavation Study Site
Vegetation Type: Vegetation Type 1 of 2

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	POLYGONACEAE	*Polygonum punctatum*	OBL	N
=20-50%	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
<20%	APIACEAE	*Foeniculum vulgare*	FACU	E
	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	BRASSICACEAE	*Lepidium latifolium*	FACW	I
	CHENOPODIACEAE	*Atriplex triangularis*	FACW	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	LAMIACEAE	*Mentha arvensis*	FACW	E
	POACEAE	*Paspalum dilatatum*	FAC	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	SALICACEAE	*Salix lasiolepis*	FACW	N
	TYPHACEAE	*Typha latifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 30

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Jones Creek	**Survey Date**: 9/8/99
Project/Activity: 2nd year post-project: Excavation study site	**Investigator**: Janell Hillman
Location: From Hwy 152 to 930 ft d/s	Vegetation Type 2 of 2

If nontidal: Is water present in channel? yes
Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**
Maps or photos used: Yellow book map

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	**a. Bulrush, cattail, burreed or mix**
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos Disc 6

Vegetation description:

This habitat type on Jones Creek was dominated by *Typha latifolia* (>50% relative cover). All other species present occurred in smaller quantities, with *Polygonum punctatum* common but at less than 20% relative cover. The invasive *Lepidium latifolium* was present in the wetland and at the upland fringe, but at cover values of less than 5%. In general, native species relative percent cover was quite high, with most weedy vegetation occurring in upland areas on the upper channel banks.

Estimated wetland amount: 6588 sq. ft, or 0.15 acre
366 ft long (length was broken up into discontinuous patches) x 18 ft wide average wetland width = 6588 sq. ft.

SCVWD Wetlands Plant List

Facility Name:	Jones Creek	**Survey Start Date:**	9/8/99
Location:	from Hwy 152 d/s approx. 930 ft (to weir)	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Excavation Study Site
Vegetation Type: Vegetation Type 2 of 2

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	TYPHACEAE	*Typha latifolia*	OBL	N
<20%	BRASSICACEAE	*Lepidium latifolium*	FACW	I
	CHENOPODIACEAE	*Atriplex triangularis*	FACW	N
	LAMIACEAE	*Mentha arvensis*	FACW	E
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	SALICACEAE	*Salix lasiolepis*	FACW	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 30

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Los Coches	**Survey Date**: 9/1/99
Project/Activity: 2nd year post-project excavation site	**Investigator**: Janell Hillman
Location: u/s Dempsey to d/s South Park Victoria Dr.	Vegetation type 1 of 2

If nontidal: Is water present in channel? Yes
Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure
Maps or photos used: Los Coches Creek, Sheet 1 of 1; image C59189ADJ

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos, disc 3 and 4

Vegetation description:

Vegetation type 1 of 2 consisted of a narrow, thickly vegetated native wetland band in the low flow channel, which was surrounded by a weedy, moist, upland-transitional wetland of much lower native species relative percent cover (vegetation type 2 of 2).

A thick mat of *Rorippa nasturtium-aquaticum* completely covered the narrow stream bed, forming greater than 50% relative cover. Running water was present in the channel bed. Along the banks of this narrow channel, a low bar of sandy, moist soil with large pebbles and cobbles supported a mixed fringe of wetland vegetation roughly three feet in width. This fringe was made up of

Epilobium and *Picris echiodies*, with scattered *Typha* sp. and *Salix laevigata* seedlings. This fringe soon transitioned into a much weedier wetland type of lower total percent cover (see other vegetation type 2).

Comparison summary:

Rorippa has really filled in this year. No open stream or running water was visible (too much veg. cover) during this year's survey.

Estimated wetland amount: 0.09 acre

SCVWD Wetlands Plant List

Facility Name:	Los Coches Creek	**Survey Start Date:**	9/1/99
Location:	from South Park Victoria Dr to Dempsey Rd	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Excavation Study Site
Vegetation Type: Type 1 of 2: native

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
<20%	APIACEAE	*Conium maculatum*	FACW	E
	APIACEAE	*Foeniculum vulgare*	FACU	E
	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	EUPHORBIACEAE	*Ricinis communis*	FACU	E
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	ONAGRACEAE	*Epilobium sp.*	NOL	N
	POACEAE	*Phalaris aquatica*	FAC+	E
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Agrostis viridis*	OBL	E
	SALICACEAE	*Populus fremontii*	FACW	N
	SALICACEAE	*Salix laevigata*	NOL	N
	SALICACEAE	*Salix lasiolepis*	FACW	N
	TYPHACEAE	*Typha angustifolia*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 23

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Los Coches	**Survey Date**: 9/1/99
Project/Activity: 2nd year post-project survey: excavation study site	**Investigator**: Janell Hillman
Location: u/s of Dempsey to d/s of South Park Victoria Dr.	Vegetation type 2 of 2

If nontidal: Is water present in channel? Yes
Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure
Maps or photos used: Los Coches Creek, Sheet 1 of 1; image C59189ADJ

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	**c. Nonnative(s)**
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	51-75%	26-50%	**11-25%**	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):Species list; digital photos, disc 3 and 4

Vegetation description:

Vegetation type 2 of 2 consisted of a mixed upland-transitional community of weedy, moist vegetation which surrounded a narrow, thickly vegetated band of native wetland in the low flow channel (vegetation type 1 of 2).

Weedy vegetation was found on a low bar of irregular topography and sandy, moist soil with pebbles, cobbles, and chunks of broken concrete which existed above the low flow channel. Dominance was provided overwhelmingly by *Picris echioides*(>50% relative cover), a facultative species. Other species present included scattered *Polypogon monspeliensis*, *Cyperus eragrostis*, *Lythrum californicum*, and *Salix* spp. Total cover was about 85%; thick in some places and sparse in others. Native species relative percent cover was very low.

Comparison summary:

One of the main differences seen this year in this habitat is the high total cover compared to last year's values. Overwhelmingly, the cover this year has been provided by *Picris echioides*.

Estimated wetland amount: 0.04 acre

SCVWD Wetlands Plant List

Facility Name:	Los Coches Creek	**Survey Start Date:**	9/1/99
Location:	from South Park Victoria Dr to Dempsey Rd	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Excavation Study Site
Vegetation Type: Type 2 of 2: weedy

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	ASTERACEAE	*Picris echioides*	FAC	E
<20%	ASTERACEAE	*Gnaphalium luteo-album*	FACW-	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Agrostis viridis*	OBL	E
	SALICACEAE	*Salix laevigata*	NOL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 23

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Lower Penitencia	**Survey Date**: 10/6/99
Project/Activity: 2nd year post-project: excavation study site	**Investigator**: Janell Hillman
Location: From Milmont bridge to about 1925 ft d/s (West Channel)	

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: Lower Penitencia d/s Milmont Dr., sheet 1, photo date 8/16/99; # C59196

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	5% or less	**6-25%**	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos disc 11

Vegetation description:

This site was dominated by *Scirpus californicus* (>50% relative cover). *Typha latifolia* and *T. angustifolia* were common and occurred at close to 20% relative cover, collectively. The invasive *Lepidium latifolium* was also common in the wetland, with a relative cover of close to 10%. In some areas it occurred at the wetland/upland fringe, but mostly it was distributed throughout the wetland. In some places it grew right at the water's edge.

Total percent cover was thick. Soil was moist silt and clay, with the upper slightly drier soil cracking in large pieces. The *Typha* had yellowed leaves and did not look that healthy.

Comparison summary:

There was definitely a greater abundance of *Lepidium* in the wetland than in the previous year. While still a dominant in the upland along the levy slope, it has since moved down to the water's edge and forms a mixed community with the *Scirpus*. It is especially prevalent towards the downstream end of the sample site. I also found much lower numbers this year of the low-growing herbaceous species such as *Atriplex triangularis* and *Polygonum* spp.

Estimated wetland amount: 1.04 acres

SCVWD Wetlands Plant List

Facility Name:	Lower Penitencia Creek	**Survey Start Date:**	10/6/99
Location:	from Milmont Dr. d/s approx. 1900 ft	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Excavation Study Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	CYPERACEAE	*Scirpus californicus*	OBL	N
<20%	ASTERACEAE	*Baccharis douglasii*	OBL	N
	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Euthamia occidentalis*	OBL	N
	ASTERACEAE	*Cirsium vulgare*	FACU	E
	BRASSICACEAE	*Lepidium latifolium*	FACW	I
	CHENOPODIACEAE	*Atriplex triangularis*	FACW	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	JUGLANDACEAE	*Juglans californica var. hindsii*	FAC	N
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	MYRTACEAE	*Eucalyptus sp.*	NOL	E
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	PLATANACEAE	*Platanus racemosa*	FACW	N
	POACEAE	*Arundo donax*	FACW	I
	POACEAE	*Polypogon interruptus*	OBL	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	SALICACEAE	*Populus fremontii*	FACW	N
	SALICACEAE	*Salix laevigata*	NOL	N
	SALICACEAE	*Salix lasiolepis*	FACW	N
	TYPHACEAE	*Typha angustifolia*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N
	URTICACEAE	*Urtica dioica ssp. holosericea*	FACW	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 36

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: North Morey Channel	**Survey Date**: 9/7/99
Project/Activity: 2nd year post-project: Excavation Study Site	**Investigator**: Janell Hillman
Location: From Santa Theresa Blvd. to outfall structure; roughly 1010 ft d/s (see notes)	

If nontidal: Is water present in channel? yes

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used:

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos Disc 5

Vegetation description:

This section of North Morey was dominated by *Polygonum punctatum* (relative cover >50%). *Typha latifolia* and *T. angustifolia* together contributed to about 20% relative cover. *Rorippa nasturtium-aquaticum* was present but in low quantities in contrast to previous year conditions. Total vegetative cover was between 76-100%. Within the channel, wetland was patchy and interspersed with areas of open water. Native species relative cover was at the low end of the 76-100% category. At the downstream portion of the study site, regrowth was almost completely absent and only a narrow, somewhat weedy fringe of wetland vegetation along the channel banks (about 1 foot wide each bank) was present. Some non-wetland areas were covered by the floating aquatic *Lemna* sp.

Average water depth in the wetland was 8 centimeters, with values ranging from 2 to 20 centimeters. The unvegetated section of the reach, where only a thin wetland fringe existed along the banks and the water in the channel was covered only with *Lemna* sp., averaged 120 centimeters deep, with values ranging from 110 to 130 centimeters.

Comparison summary:

Much more *P. punctatum* and much less *Rorippa* than last year.

Estimated wetland amount: 7122 sq. ft., or 0.16 acre
798 ft length minus 200 feet disturbance by bridge construction x 16 ft wide @ 70% wetland = 6698 sq. ft.
212 ft length x 2ft wide fringe along banks = 424 sq. ft.

Notes: A solid span bridge, presently under construction and spanning both North and South Morey Channels, has impacted wetlands in the channel for a length of about 200 feet (from 325 ft to 530 ft d/s Santa Theresa Blvd on North Morey). This impacts the excavation study site on North Morey Channel. At the time of survey, the bridges were still under construction. The channel had been dried back, the water diverted around the construction downstream, and substrate in the channel and on the banks had been disturbed to the extent that there was no vegetation at all present. Some earth had been mounded up to build a small dam for water diversion. The bridges appear to be low enough in stature that the channel underneath will be shadowed at all times, thus precluding the re-establishment of wetland vegetation.

SCVWD Wetlands Plant List

Facility Name:	North Morey Channel	**Survey Start Date:**	9/7/99
Location:	from Santa Theresa Blvd d/s approx 1010 ft (to outfall)	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Excavation Study Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	POLYGONACEAE	*Polygonum punctatum*	OBL	N
<20%	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	FABACEAE	*Melilotus alba*	FACU+	E
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	SALICACEAE	*Salix laevigata*	NOL	N
	TYPHACEAE	*Typha angustifolia*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 28

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: San Tomas Aquino Creek	**Survey Date**: 9/16/99
Project/Activity: 2nd Year Project Survey	**Investigator**: Louisa Squires
Location: Hwy 237 to Great America Pkwy	Vegetation Type 1 of 2 - Low Wetland

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map (b) **photo** (c) field measure

Maps or photos used: San Tomas Creek d/s Great America Parkway, Sheets 1 and 3, Color (flown 8/2/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. **California bulrush**	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: Vegetation was separated into two categories on this site: low marsh dominated by tall perennial emergent vegetation with some fringing rooted aquatic species (vegetation type 1) and middle to high marsh dominated by wetland grasses and forbs (vegetation type 2).

The low marsh was a dense (100% total cover) stand of *Scirpus californicus* (relative cover 60%) and *Typha domingensis* (relative cover 30%). The wetland consisted of a large peninsula at the downstream end of the site, clumping in-stream vegetation patches and fringing vegetation along the levees. This vegetation type also included in-stream patches of rooted aquatic species dominated by *Ludwigia peploides* ssp. *peploides* (relative cover 5%) and lesser amounts of *Veronica anagallis-aquatica* and

Rorripa nasturtium-aquaticum. Relative cover of the rooted aquatic species was approximately 5% or less.

Estimated wetland amount: Site total: 1.12 acres

Notes:

In comparison to 1998, several changes were noted in the vegetation. First, there was a small increase in the amount of low marsh vegetation within the project site, largely due to an increase in *S. californicus,* but also the rooted aquatics. Second, there has been an overall convergence of vegetation in the middle to high marsh zones. Whereas in 1998, there were four distinct vegetation types, in 1999 there were only two. Overall, there was more uniform distribution of species throughout the site and a shift in dominance towards grasses. In addition, there has been a slight increase in native cover. *Xanthium strumarium*, which formed the dominant cover in one location last year occurred only sparsely in some locations this year. It appears that sedimentation has occurred in this location, resulting in more uneven topography and reduced depth and frequency of flooding in comparison to last year.

Instream Wetlands Plant Checklist - SCVWD Maintenance Program

Stream/Location/Project: San Tomas Hwy 237 to Great America Veg Type 1 Date: 9/16/99

FAMILY NAME		**SPECIES** **(Bold = Native P= Pest or invasive)**	**INDICATOR STATUS**	REL. COV. (%)		
				<20	20-50	> 50
BRASSICACEAE		***Rorippa nasturtium-aquaticum***	**OBL**	X		
CYPERACEAE		***Scirpus californicus***	**OBL**			**X**
CYPERACEAE		***Scirpus robustus***	**OBL**	**X**		
ONAGRACEAE		***Ludwigia peploides ssp. peploides***	**OBL**	**X**		
POACEAE		***Leersia oryzoides***	**OBL**	X		
POLYGONACEAE		*Polygonum persicaria*	FACW	X		
POLYGONACEAE		***Polygonum punctatum***	**OBL**	X		
SCROPHULARIACEAE		*Veronica anagallis-aquatica*	OBL	X		
TYPHACEAE		***Typha domingensis***	**OBL**		**X**	

Additional Comments: NI = listed but no wetland status indicated

NOL = not on list

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: San Tomas Aquino Creek	**Survey Date**: 9/16/99
Project/Activity: 2nd Year Project Survey	**Investigator**: Louisa Squires
Location: Hwy 237 to Great America Pkwy	Vegetation Type 2 of 2 - Mid to High Wetland

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map (b) **photo** (c) field measure

Maps or photos used: San Tomas Creek d/s Great America Parkway, Sheets 1 and 3, Color (flown 8/2/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. **Other native**	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: Vegetation was separated into two categories on this site: low marsh dominated by tall perennial emergent vegetation with some fringing rooted aquatic species (vegetation type 1) and middle to high marsh dominated by wetland grasses and forbs (vegetation type 2).

Vegetation Type 2 is a diverse matrix of middle and high marsh, dominated by wetland grasses and forbs. *Agrostis viridis* (relative cover 30%) and *Leersia oryzoides* (relative cover 20%) were the dominant grasses. *Polygonum* spp. (*P. punctatum*, *P. lapathifolium* and *P. persicaria*) were the dominant forbs. Other species present included *Echinochloa crus-galli, S. robustus, Paspalum distichum* and *P. dilatatum*, *Atriplex triangularis*, and *Cynodon dactylon.*

Estimated wetland amount: Site total: 0.91 acres

Notes:

See Notes section on the checklist for Vegetation Type 1 of 2.

Instream Wetlands Plant Checklist - SCVWD Maintenance Program

Stream/Location/Project: San Tomas Hwy 237 to Great America, Veg Type 2 Date: 9/16/99

FAMILY NAME		SPECIES (Bold = Native P= Pest or invasive)	INDICATOR STATUS	REL. COV. (%)		
				<20	20-50	> 50
ASTERACEAE		*Picris echioides*	FAC	X		
BRASSICACEAE	P	*Lepidium latifolium*	FACW	X		
CHENOPODIACEAE		***Atriplex triangularis***	**FACW**	**X**		
CYPERACEAE		***Cyperus eragrostis***	**FACW**	**X**		
CYPERACEAE		***Scirpus californicus***	**OBL**	**X**		
CYPERACEAE		***Scirpus robustus***	**OBL**	**X**		
FABACEAE		*Melilotus alba*	FACU+	X		
JUNCACEAE		***Juncus xiphioides***	**OBL**	**X**		
ONAGRACEAE		***Epilobium ciliatum ssp. ciliatum***	**FACW**	**X**		
ONAGRACEAE		***Ludwigia peploides ssp. peploides***	**OBL**	**X**		
POACEAE		*Agrostis viridis*	OBL		X	
POACEAE		*Cynodon dactylon*	FAC	X		
POACEAE		*Echinochloa crus-galli*	FACW	X		
POACEAE		***Leersia oryzoides***	**OBL**		X	
POACEAE		*Paspalum dilatatum*	FAC	X		
POACEAE		***Paspalum distichum***	**OBL**	X		
POACEAE		*Phalaris aquatica*	FAC+	X		
POACEAE		*Polypogon monspeliensis*	FACW+	X		
POLYGONACEAE		***Polygonum lapathifolium***	**OBL**	X		
POLYGONACEAE		*Polygonum persicaria*	FACW	X		
POLYGONACEAE		***Polygonum punctatum***	**OBL**	X		
TYPHACEAE		***Typha domingensis***	**OBL**	**X**		

Additional Comments: NI = listed but no wetland status indicated

NOL = not on list

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: San Tomas Aquino Creek	**Survey Date**: 9/14/99
Project/Activity: 2nd year post-project excavation site	**Investigator**: Janell Hillman
Location: between Central Expressway and the SPRR	

If nontidal: Is water present in channel? yes

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: San Tomas u/s Hwy 101; photo date 8/2/99; sheet 2 of 2

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos Disc 7

Vegetation description:

This section of San Tomas was almost toe-to-toe wetland, with *Ludwigia peploides* providing the majority of cover (>50%). *Rorippa nasturtium-aquaticum* was present in several well-developed patches, especially in the upstream section between Walsh and the SPRR, but overall relative cover for this species was less than 20%. Similarly, there were some patches of *Typha latifolia* and *T. angustifolia* at less than 20% relative cover throughout the site. Native species relative cover was high (76-100% category), with most exotic species occurring in a thin band at the wetland/upland transitional fringe.

Scattered individuals of wetland species existed along the cobbled lower access road (left bank) between Walsh and Central Expressway, but were not included in wetland acreage calculations due to low cover and drier soil conditions.

The invasive *Lepidium latifolium* was present in the wetland, as it has been in the past, but at relative cover values of less than 5%.

Estimated wetland amount: 1.29 acre

Central Expressway to Walsh = 1.05 acre
Walsh to SPRR = 0.24 acre

SCVWD Wetlands Plant List

Facility Name:	San Tomas Aquino Creek	**Survey Start Date:**	9/14/99
Location:	from Central Expwy to SPRR bridge	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Excavation Study Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
<20%	AMARANTHACEAE	*Amaranthus retroflexus*	FACU	E
	APIACEAE	*Foeniculum vulgare*	FACU	E
	ASTERACEAE	*Lactuca serriola*	FAC	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	BETULACEAE	*Alnus rhombifolia*	FACW	N
	BRASSICACEAE	*Lepidium latifolium*	FACW	I
	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
	CHENOPODIACEAE	*Chenopodium ambrosioides*	FAC	E
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	EQUISETACEAE	*Equisetum arvense*	FAC	N
	FABACEAE	*Melilotus alba*	FACU+	E
	LAMIACEAE	*Mentha suaveolens*	FACW	E
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	PLANTAGINACEAE	*Plantago lanceolata*	FAC-	E
	PLATANACEAE	*Platanus racemosa*	FACW	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Cynodon dactylon*	FAC	E
	POACEAE	*Paspalum distichum*	OBL	N
	POACEAE	*Piptatherum miliaceum*	NOL	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Leersia oryzoides*	OBL	N
	POACEAE	*Agrostis viridis*	OBL	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	SALICACEAE	*Populus fremontii*	FACW	N
	SALICACEAE	*Salix laevigata*	NOL	N
	SALICACEAE	*Salix lasiolepis*	FACW	N
	SOLANACEAE	*Solanum sp.*	NOL	E
	TYPHACEAE	*Typha angustifolia*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 33

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Saratoga	**Survey Date**: 9/8/99
Project/Activity: 2nd year post '97 SR Survey	**Investigator**: GR
Location: From STA confluence to Cabrillo,	Vegetation Type 1 of 2 - Low Wetland

If nontidal: Is water present in channel? Yes

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: Saratoga Creek U/S San Tomas Aquino, Sheet 1, Color (flown 8/2/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: Vegetation was separated into two categories on this site: low herbarceous vegetation was located primarily in areas with surface water, or on low sediment bars only inches above surface water at the time of the survey; tall perennial emergent vegetation (*Typha* dominated) was located on the upper fringes of the low wetland, and on higher sediment bars.

The low vegetation (low in both stature and topographic position) cover was very high, nearly 100%. *Ludwigia peploides* was the predominant species, with about 80% relative cover. *Veronica anagallis -aquatica* was the next most abundant species, with nearly 20% relative cover. *Rorippa nasturtium-aquaticum* was also typical.

Wetland occupied the entire bed of the channel from toe to toe (including the location of the depressed maintenance road) throughout almost all of the site. The low wetland grew in a meandering strip varying from approximately 8 to 20 feet in width throughout much, but not all, of the site. The different vegetation types could not be consistently distinguished in the aerial photograph, nor could they reasonably be measured in the field due to the complexity of the pattern. Based on general distribution and the general width of the low vegetation strip, the low vegetation is estimated to comprise about 40% of the site; the high is estimated to comprise about 60% of the site.

Estimated wetland amount: Site total: 1.19 ac. Approximately 40% (0.48 ac) is estimated to comprise low wetland

Notes: Site topography has changed since last year. A nascent low-flow channel (supporting low wetland) rimmed by higher bars is fairly consistent throughout most of the site. The location of the low flow channel meanders from side to side. Typical water depths varied from approximately 0.5 to 1.5 ft. The low flow channel contained surface water, while the bars were above the water. No cross-sectional pattern in sediment distribution was noted last year, and shallow surface water covered the entire channel bed from bank to bank. Most of the sediment bars supported high wetland, and the sediment was very moist, indicating that water levels may have dropped below their surface recently. One sediment bar in the most upstream part of the site was higher than the others, and did not support wetland. This area supported upland vegetation dominated by a dense stand of *Melilotus alba.*

SCVWD Wetlands Plant List

Facility Name:	Saratoga Creek	**Survey Start Date:**	9/8/99
Location:	from San Tomas Aquino Crk to Cabrillo Ave	**Investigator:**	Gale Rankin

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Excavation Study Site
Vegetation Type: 1 of 2 - Low Wetland

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
<20%	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
	EQUISETACEAE	*Equisetum arvense*	FAC	N
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Holcus lanatus*	FAC	E
	POACEAE	*Eragrostis mexicana ssp. virescens*	FAC	N
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	SALICACEAE	*Salix lasiolepis*	FACW	N
	SCROPHULARIACEAE	*Veronica anagallis-aquatica*	OBL	E
	TYPHACEAE	*Typha angustifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 55

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Saratoga	**Survey Date**: 9/8/99
Project/Activity: 2nd year post SR survey	**Investigator**: GR
Location: From STA confluence to Cabrillo,	Vegetation Type 2 of 2, High Wetland

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: Saratoga Creek U/S San Tomas Aquino, Sheet 1, Color (flown 8/2/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	**a. Bulrush, cattail, burreed or**
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: Refer to Saratoga site checklist for low vegetation (previous) for a general description of site vegetation and topography.

Cattail (*Typha* sp.) dominated vegetation occupied the higher sediment bars of the site, and the upper fringes of the low wetland strip. The sediment bars were estimated to be up to 2 feet above the water surface at the time of the survey. The granular sediment several feet from the water's edge was wet to the surface indicating that surface water was likley present recently. Total cover of vegetation was nearly 100%, consisting mostly of *Typha latifolia*. Numerous other species, all with relative cover well below 20% were scattered in patches throughout the cattail stands, or on stand edges. *Polygonum persicaria* was the most prevalent of these species, followed by *Veronica anagallis-aquatica*. *Ludwigea peploides* was sometimes found in the *Typha* understory.

Estimated wetland amount: Site total: 1.19. Approximately 60% (0.71 ac) is estimated to comprise high wetland

SCVWD Wetlands Plant List

Facility Name:	Saratoga Creek	**Survey Start Date:**	9/8/99
Location:	from San Tomas Aquino Crk to Cabrillo Ave	**Investigator:**	Gale Rankin

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Excavation Study Site
Vegetation Type: 2 of 2 - High Wetland

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	TYPHACEAE	*Typha latifolia*	OBL	N
<20%	APIACEAE	*Foeniculum vulgare*	FACU	E
	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Bidens frondosa*	FACW	N
	ASTERACEAE	*Baccharis salicifolia*	FACW-	N
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	BRASSICACEAE	*Lepidium latifolium*	FACW	I
	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	EUPHORBIACEAE	*Ricinis communis*	FACU	E
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	POACEAE	*Paspalum dilatatum*	FAC	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Lolium multiflorum*	NOL	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	SCROPHULARIACEAE	*Veronica anagallis-aquatica*	OBL	E
	TYPHACEAE	*Typha angustifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 55

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: South Morey Channel	**Survey Date**: 9/7/99
Project/Activity: 2nd year post-project survey: Excavation study site	**Investigator**: Janell Hillman
Location: From Santa Theresa Blvd to830 ft d/s (see notes below)	Vegetation Type 1 of 2

If nontidal: Is water present in channel? yes

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used:

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos Disc 4

Vegetation description:

Located from 262 to 610 ft downstream of Santa Theresa Blvd, this section of the channel was dominated by *Ludwigia peploides* (>50% relative cover). Total cover was 100%, with native species making up the majority of cover (76-100%). There was an occasional scattered fringe of *Typha* spp. The wetland occupied the entire bed from bank to bank.

Average water depth in this habitat type was 1.4 meters, with values ranging from 1.0 to 1.9 meters.

Estimated wetland amount:
348 ft long x 19 ft wide = 6612 sq. ft., or 0.15 acre

Notes: The first 610 ft. d/s of Santa Theresa Blvd. was excavated from bank to bank in 1997. From 610 to 830 ft, one half the channel was excavated and half the wetland was removed.

A bridge approximately 200 feet wide was under construction at the time of the 1999 surveys and impacts both North and South Morey Channels. On South Morey, the bridge begins at about 700 ft. d/s of Santa Theresa. It impacts the remaining 130 ft. at the d/s end of the Excavation Study Site and 70 ft. at the u/s end of the Adjacent Reference Site on South Morey. The channel beneath the bridge was disturbed and devoid of wetland vegetation due to bridge construction.

SCVWD Wetlands Plant List

Facility Name:	South Morey Channel	**Survey Start Date:**	9/7/99
Location:	from Santa Theresa Blvd d/s approx 830 ft	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Excavation Study Site
Vegetation Type: Type 1 of 2

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
<20%	CYPERACEAE	*Scirpus californicus*	OBL	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	TYPHACEAE	*Typha angustifolia*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 25

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: South Morey Channel	**Survey Date**: 9/7/99
Project/Activity: 2nd year post-project-excavation study site	**Investigator**: Janell Hillman
Location: from Santa Theresa Blvd to 830 ft d/s (see notes below)	Vegetation Type 2 of 2

If nontidal: Is water present in channel? yes

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used:

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	**a. Bulrush, cattail, burreed or**
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos Disc 4 and 5

Vegetation description:

This vegetation type was dominated by *Typha latifolia* (>50% relative cover), with *Scirpus californicus* as sub-dominant (20-50% relative cover). *Typha angustifolia* was also present, in lower quantities. Total vegetative cover was high. Like vegetation type 1 of 2, vegetation occupied the entire channel bed from bank to bank. This vegetation type was mainly clustered at the upstream extent of the sample site near Santa Theresa Blvd, and ranged from 0 to 262 ft and from 610 to 700 ft d/s Santa Theresa.. *S. californicus* was very common in the d/s section of the sample site near the bridge which is presently being constructed, but was absent in the upstream section. This downstream portion of the study site is the section that received only half-channel excavation during the 1997 maintenance project.

Average water depth in this vegetation type was 0.6 meters, with values ranging from 0.2 to 1.1 meters.

Comparison summary:

The upstream location occupied by this vegetation type was a somewhat weedy bar with lower cover values and a mixed vegetation type (*Typha* not dominant) last year.

Estimated wetland amount: 6688 sq. ft, or 0.15 acre
262 ft at u/s portion and 90 feet at d/s portion of sample site = 352 ft long x 19 ft wide = 6688 sq. ft.

Notes: A bridge, presently under construction and spanning both North and South Morey Channels, has impacted wetlands in the channel for a length of about 200 feet (from 700 ft d/s Santa Theresa Blvd to 900 ft d/s). This impacts both the excavation study site (130 ft) and the adjacent reference site (70 ft) on South Morey Channel.

SCVWD Wetlands Plant List

Facility Name:	South Morey Channel	**Survey Start Date:**	9/7/99
Location:	from Santa Theresa Blvd d/s approx 830 ft	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Excavation Study Site
Vegetation Type: Type 2 of 2

Relative Cover	Family	Species	Wetland Indicator Status	Origin [1]
>50%	TYPHACEAE	*Typha latifolia*	OBL	N
=20-50%	CYPERACEAE	*Scirpus californicus*	OBL	N
<20%	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	POACEAE	*Paspalum dilatatum*	FAC	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	SALICACEAE	*Salix laevigata*	NOL	N
	TYPHACEAE	*Typha angustifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 25

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa L. Pen to Calveras Rd.	**Survey Date**: 9/28/99
Project/Activity: 1st year post '98 SR project excavation site survey	**Investigator**: G. Rankin
Location: L. Pen Creek to RR	Tidal vegetation type 1 of 4 (tidal non-native: *Echinochloa* dominated)

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used:1999 Regrowth Study -Berryessa u/s Lower Pen Sheet 1 (photo date 8/16/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	51-75%	26-50%	11-25%	**10% or less**
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): plant list

Vegetation description: The vegetation generally grew in areas that were just slightly higher than those that were dominated by *Typha*. *Typha* and *Ludwigia* (tidal vegetation type 2) grew at the lowest vegetated elevation on the site. The substrate was saturated mud, clearly inundated by the last high tide. The non-native grass *Echinochloa crus-galli* comprised nearly 100% relative cover in this very dense vegetation. Numerous other species were present, but these generally occurred on fringes where the vegetation transitioned either to upland or other wetland vegetation types. Typical fringe species included *Typha latifolia*, *Polypogon monspeliensis*, *Cyperus eragrostis*, and *Picris echioides*.

Estimated wetland amount: 0.32

Notes: Located in the Lower Pen to Abel section

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	9/28/99
Location:	from Calaveras Blvd to Lower Penitencia Crk	**Investigator:**	Gale Rankin

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Excavation Study Site
Vegetation Type: Tidal type 1 of 4 (Echinochlo-dominated)

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	POACEAE	*Echinochloa crus-galli*	FACW	E
<20%	ASTERACEAE	*Conyza canadensis*	FAC	N
	ASTERACEAE	*Cotula coronopifolia*	FACW+	E
	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Bidens frondosa*	FACW	N
	ASTERACEAE	*Lactuca serriola*	FAC	E
	ASTERACEAE	*Centaurea solstitialis*	NOL	I
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	ASTERACEAE	*Aster subulatus var. ligulatus*	FACW	N
	BRASSICACEAE	*Lepidium latifolium*	FACW	I
	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
	BRASSICACEAE	*Raphanus sativus*	UPL	E
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	FABACEAE	*Melilotus indica*	FAC	E
	JUNCACEAE	*Juncus xiphioides*	OBL	N
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	POACEAE	*Cynodon dactylon*	FAC	E
	POACEAE	*Leptochloa fascicularis*	OBL	N
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Lolium multiflorum*	NOL	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	PRIMULACEAE	*Anagallis arvensis*	FAC	E
	SALICACEAE	*Salix laevigata*	NOL	N
	SALICACEAE	*Salix lasiolepis*	FACW	N
	TYPHACEAE	*Typha latifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 57

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa, L. Pen to Calveras Rd.	**Survey Date**: 9/28/99
Project/Activity: 1st year post '98 SR project excavation site survey	**Investigator**: G. Rankin
Location: L. Pen Creek to RR	Tidal vegetation type 2 of 4 (tidal cattail-dominated)

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used:1999 Regrowth Study -Berryessa u/s Lower Pen Sheet 1 (photo date 8/16/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): plant list

Vegetation description: The vegetation that occupied the lowest vegetated areas of the site consisted predominantly of dense stands of *Typha latifolia.* Less abundant were fairly large, dense monotypic, round stands of *Scirpus californicus. Ludwigia* occassionally grew into the channel, and around the bases of the *Typha.* Occasionally, *Agrostis* also grew either in monotypic patches or among the bases of *Typha* culms. The substrate was saturated mud, clearly inundated by the last high tide. This vegetation was most often located directly next to the open central channel, however in some locations, it also occupied lower elevation strips parallel to but separated from the channel by a higher berms that were not excavated in 1998. Few other species were present in this vegetation. Those that were present included *Echinochloa crus-galli*, *Picris echioides*, *Lythrum californicum*, and *Polygonum lapathifolium*.

Estimated wetland amount: 0.56 ac

Notes: Located between Lower Pen to the railroad

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	9/28/99
Location:	from Calaveras Blvd to Lower Penitencia Crk	**Investigator:**	Gale Rankin

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Excavation Study Site
Vegetation Type: Tidal type 2 of 4 (cattail-dominated)

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	TYPHACEAE	*Typha latifolia*	OBL	N
<20%	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	CYPERACEAE	*Scirpus californicus*	OBL	N
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Leptochloa fascicularis*	OBL	N
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Agrostis sp.*	NOL	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 57

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa L. Pen to Calveras Rd.	**Survey Date**: 9/28/99
Project/Activity: 1st year post '98 SR project excavation site survey	**Investigator**: G. Rankin
Location: L. Pen Creek to RR	Tidal vegetation type 3 of 4 (tidal - other native)

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used:1999 Regrowth Study -Berryessa u/s Lower Pen Sheet 1 (photo date 8/16/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): plant list

Vegetation description: Like tidal vegetation type 1, this vegetation type grew in areas that were slightly higher than those dominated by *Typha*. The species composition of this vegetation type was also similar to that of tidal vegetation type 1, however species abundance within the vegetation was notably different. *Echinochloa crus-galli* was present, but not dominant; species dominance was variable and mixed; and though no one species was prevalent throughout, natives were more abundant than non-natives. Among the most abundant natives were *Aster subulatus* var. *ligulatus, Cyperus eragrostis*, and *Polygonum lapathifolium*.. *Polygonum persicaria*, *Echinochloa*, *Xanthium strumarium*, and *Polypogon monspeliensis* were typical non-natives. Native species relative cover was only slightly greater than that of non-natives.

Estimated wetland amount: 0.19 ac

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	9/28/99
Location:	from Calaveras Blvd to Lower Penitencia Crk	**Investigator:**	Gale Rankin

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Excavation Study Site
Vegetation Type: Tidal type 3 of 4 (other native-dominated)

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
<20%	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Lactuca serriola*	FAC	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	ASTERACEAE	*Aster subulatus var. ligulatus*	FACW	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Leptochloa fascicularis*	OBL	N
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	TYPHACEAE	*Typha latifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 57

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa L. Pen to Calaveras Rd.	**Survey Date**: 9/28/99
Project/Activity: 1st year post '98 SR project excavation site survey	**Investigator**: G. Rankin
Location: L. Pen Creek to RR	Tidal vegetation type 4 of 4 (tidal - non- native, mixed dominance)

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used:1999 Regrowth Study -Berryessa u/s Lower Pen Sheet 1 (photo date 8/16/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	51-75%	**26-50%**	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): plant list

Vegetation description: This vegetation type was like vegetation type 3 (tidal- other native), except that non-native species relative cover was slightly greater than that of native species. *Echinochloa* was the most prevalent species, with over 20% relative cover, however, numerous other species were also abundant throughout.

Estimated wetland amount: 0.27 ac

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	9/28/99
Location:	from Calaveras Blvd to Lower Penitencia Crk	**Investigator:**	Gale Rankin

Survey Chronology:	Post-Project Survey- 1st Year
Site Type:	RS, Excavation Study Site
Vegetation Type:	Tidal type 4 of 4 (non-native, mixed dominance)

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
=20-50%	POACEAE	*Echinochloa crus-galli*	FACW	E
<20%	ASTERACEAE	*Conyza canadensis*	FAC	N
	ASTERACEAE	*Cotula coronopifolia*	FACW+	E
	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Lactuca serriola*	FAC	E
	ASTERACEAE	*Centaurea solstitialis*	NOL	I
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	BRASSICACEAE	*Lepidium latifolium*	FACW	I
	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
	BRASSICACEAE	*Raphanus sativus*	UPL	E
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	FABACEAE	*Melilotus indica*	FAC	E
	JUNCACEAE	*Juncus xiphioides*	OBL	N
	LAMIACEAE	*Mentha sp.*	NOL	UNK
	LAMIACEAE	*Hemizonia sp.*	NOL	UNK
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	POACEAE	*Cynodon dactylon*	FAC	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Lolium multiflorum*	NOL	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	PRIMULACEAE	*Anagallis arvensis*	FAC	E
	SALICACEAE	*Salix laevigata*	NOL	N
	TYPHACEAE	*Typha latifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 57

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa L. Pen to Calaveras Rd.	**Survey Date**: 9/28 and 9/29/99
Project/Activity: 1st year post '98 SR project excavation site survey	**Investigator**: G. Rankin
Location: RR to Calaveras Blvd.	Non-tidal vegetation type 1 of 5 (Low wetland)

If nontidal: Is water present in channel? Yes

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: 1999 Regrowth Study -Berryessa u/s Lower Pen Sheets 2 and 3 (photo date 8/16/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: The low wetland grows within the low -flow channel throughout the entire non-tidal reach (from the railroad tracks u/s to Highway 237), where surface water was flowing during site surveys. It also grows on low benches abutting the low flow channel and includes narrow fringes of wetland vegetation growing higher on the bank between the low wetlands and the upland slopes. *Ludwigia peploides* was the most abundant species and had over 50% relative cover. All other species had <20% cover for the site overall. *Typha latifolia* and *T. angustifolia* were present throughout, often scattered among the other vegetation, but occasionally occurring in fairly dense stands on the low bars and fringes. *Polygonum lapthifolium* was also fairly abundant throughout, but was most abundant between Milpitas Blvd. and Hillsdale, where the relative cover was > 20%. Patches of *Rorippa nasturtium-aquaticum* were most prevalent near the very upstream and downstream end. Other typical species included, *Echinochloa crus-galli*, *Lythrum californicum*, *Polygonum punctatum* and *Cyperus eragrostis*. Fringing species included *Picris echioides* and *Polypogon monspeliensis*.

Estimated wetland amount: 1.44 ac

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	9/28/99
Location:	from Calaveras Blvd to Lower Penitencia Crk	**Investigator:**	Gale Rankin

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Excavation Study Site
Vegetation Type: Non-tidal type 1 of 5 (Low wetland)

Relative Cover	Family	Species	Wetland Indicator Status	Origin [1]
>50%	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
<20%	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Centaurea solstitialis*	NOL	I
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	ASTERACEAE	*Aster subulatus var. ligulatus*	FACW	N
	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	CYPERACEAE	*Scirpus sp.*	NOL	UNK
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Agrostis stolonifera*	FACW	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	TYPHACEAE	*Typha angustifolia*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N

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[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 57

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa L. Pen to Calaveras Rd.	**Survey Date**: 9/28 and 9/29/99
Project/Activity: 1st year post '98 SR project excavation site survey	**Investigator**: G. Rankin
Location: RR to Calaveras Blvd.	Non-tidal vegetation type 2 of 5 (*Echinochloa*-dominated)

If nontidal: Is water present in channel? Yes

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: 1999 Regrowth Study -Berryessa u/s Lower Pen Sheets 2 and 3 (photo date 8/16/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	**c. Nonnative(s)**
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	51-75%	26-50%	11-25%	**10% or less**
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: This vegetation was strongly dominated by the non-native grass *Echinochloa crus-galli. Echinochloa* typically had >90% cover. This vegetation was located on benches above the low-flow channel. Substrate varied from gravel to mixed clay and sand. Soils were very moist at the time of surveys, usually almost saturated several inches below the surface. *Typha latifolia* was the next most abundant species, usually distributed towards the lower edge of benches, and occasionally found in small dense patches. Numerous other species were present, but these were generally sparse in cover, and occurred near the vegetation edge.

Estimated wetland amount: 0.23

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	9/28/99
Location:	from Calaveras Blvd to Lower Penitencia Crk	**Investigator:**	Gale Rankin

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Excavation Study Site
Vegetation Type: Non-tidal type 2 of 5 (Echinochloa-dominated)

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	POACEAE	*Echinochloa crus-galli*	FACW	E
<20%	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Gnaphlium luteo-album*	FACW-	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	ASTERACEAE	*Aster subulatus var. ligulatus*	FACW	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	EUPHORBIACEAE	*Ricinis communis*	FACU	E
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	POACEAE	*Leptochloa fascicularis*	OBL	N
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Agrostis stolonifera*	FACW	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	SALICACEAE	*Salix laevigata*	NOL	N
	TYPHACEAE	*Typha latifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 57

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa L. Pen to Calaveras Rd.	**Survey Date**: 9/28 and 9/29/99
Project/Activity: 1st year post '98 SR project excavation site survey	**Investigator**: G. Rankin
Location: RR to Calaveras Blvd.	Non-tidal vegetation type 3 of 5 (Mixed non-native, *Echinochloa* not abundant)

If nontidal: Is water present in channel? Yes

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: 1999 Regrowth Study -Berryessa u/s Lower Pen Sheets 2 and 3 (photo date 8/16/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	**c. Nonnative(s)**
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	51-75%	26-50%	**11-25%**	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: This transitional wetland-upland vegetation was extremely dense and consisted of a mixture of numerous mostly non-native species. No one species was dominant. The most abundant non-native species were *Agrostis* sp., *Polypogon monspeliensis*, *Lolium multiflorum*, and *Xanthium strumarium*. *Typha latifolia* was more abundant than *T. angustifolia*, and accounted for the majority of the native species cover. This vegetation mix was found only in one location, on a bench just downstream of Hillview Ave. This vegetation type was notable in that it was the only non-tidal non-native vegetation in which *Echinochloa crus-galli* was not an abundant species.

Estimated wetland amount: 0.16 ac

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	9/28/99
Location:	from Calaveras Blvd to Lower Penitencia Crk	**Investigator:**	Gale Rankin

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Excavation Study Site
Vegetation Type: Non-tidal type 3 of 5 (Mixed non-native, Echinochloa not abundant))

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
<20%	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Agrostis sp.*	NOL	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	ASTERACEAE	*Aster subulatus var. ligulatus*	FACW	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	CYPERACEAE	*Scirpus sp.*	NOL	UNK
	JUNCACEAE	*Juncus xiphioides*	OBL	N
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Cynodon dactylon*	FAC	E
	POACEAE	*Paspalum dilatatum*	FAC	E
	POACEAE	*Piptatherum miliaceum*	NOL	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Lolium multiflorum*	NOL	E
	SALICACEAE	*Populus fremontii*	FACW	N
	SALICACEAE	*Salix lasiolepis*	FACW	N
	TYPHACEAE	*Typha angustifolia*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 57

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa L. Pen to Calaveras Rd.	**Survey Date**: 9/28 and 9/29/99
Project/Activity: 1st year post '98 SR project excavation site survey	**Investigator**: G. Rankin
Location: RR to Calaveras Blvd.	Non-tidal vegetation type 4 of 5 (Mixed non-native, *Echinochloa* abundant, moderate cover)

If nontidal: Is water present in channel? Yes

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: 1999 Regrowth Study -Berryessa u/s Lower Pen Sheets 2 and 3 (photo date 8/16/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	**c. Nonnative(s)**
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	76-100%	**51-75%**	**26-50%**	11-25%	10% or less
Native species relative percent cover	76-100%	51-75%	26-50%	**11-25%**	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: This vegetation consisted of a mixture of primarily non-native species, however, the prevalent species mix was noticeably different from those in vegetation type 3, non-native species with 100% vegetation cover. In addition to being scattered on small benches throughout the upstream region of the site, this vegetation type occupied two large benches. One bench was located on the right side of the creek u/s of Milpitas Blvd. This bench displayed variable topography from its downstream to upstream end. In some locations it was relatively level, in others it consisted of a steep berm that rose abruptly from the low-flow channel, graded down into a low scallop, then graded gently up to form a bench adjacent to the lower maintenance road. Soils consisted of gravels, cobbles and clays. Downstream of Milpitas Blvd., this vegetation occurred on extensive sand benches that bordered the low flow channel on the left bank. Soils were very moist within 2" of the surface. Vegetation cover was mixed and variable, ranging from very sparse to dense, but approximately 50% overall. *Echinochloa crus-galli*, *Xanthium strumarium, Polypogon monspeliensis*, *Agrostis* sp. were among the most abundant non-native species. Native species cover was primarily due to *Typha angustifolia. Cyperus eragrostis* and *Polygonum lapathifolium* were abundant and well-distributed, but the plants themselves were of small stature, and did not contribute a large amount to the overall cover. *Xanthium strumarium*, *Equisetum arvense*, *Picris echioides*, *Polypogon monspelinesis* and *Cyperus* were typical of the higher berm areas. *Populus fremontii* and *Salix lasiolepis* saplings were scattered throughout the vegetation.

Estimated wetland amount: 2.14 ac

Notes:

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	9/28/99
Location:	from Calaveras Blvd to Lower Penitencia Crk	**Investigator:**	Gale Rankin

Survey Chronology: Post-Project Survey- 1st Year

Site Type: RS, Excavation Study Site

Vegetation Type: Non-tidal type 4 of 5 (Mixed non-native, Echinochloa abundant, moderate cover)

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
=20-50%	POACEAE	*Echinochloa crus-galli*	FACW	E
<20%	ASTERACEAE	*Conyza canadensis*	FAC	N
	ASTERACEAE	*Artemisia douglasiana*	FACW	N
	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Gnaphlium luteo-album*	FACW-	E
	ASTERACEAE	*Centaurea solstitialis*	NOL	I
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	ASTERACEAE	*Aster subulatus var. ligulatus*	FACW	N
	BRASSICACEAE	*Raphanus sativus*	UPL	E
	CHENOPODIACEAE	*Salsola tragus*	FACU	E
	CONVOLVULACEAE	*Convolvulus arvensis*	NOL	E
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	EQUISETACEAE	*Equisetum arvense*	FAC	N
	FABACEAE	*Melilotus indica*	FAC	E
	LAMIACEAE	*Hemizonia sp.*	NOL	UNK
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	PLANTAGINACEAE	*Plantago major*	FACW-	E
	POACEAE	*Cynodon dactylon*	FAC	E
	POACEAE	*Paspalum dilatatum*	FAC	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Digitaria sanguinalis*	FACU	E
	POACEAE	*Agrostis sp.*	NOL	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	PORTULACACEAE	*Portulaca oleracea*	FAC	E
	SALICACEAE	*Populus fremontii*	FACW	N
	SALICACEAE	*Salix laevigata*	NOL	N
	SCROPHULARIACEAE	*Veronica anagallis-aquatica*	OBL	E
	TYPHACEAE	*Typha angustifolia*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N
	URTICACEAE	*Urtica dioica ssp. holosericea*	FACW	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 57

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa L. Pen to Calaveras Rd.	**Survey Date**: 9/28 and 9/29/99
Project/Activity: 1st year post '98 SR project excavation site survey	**Investigator**: G. Rankin
Location: RR to Calaveras Blvd.	Non-tidal vegetation type 5 of 5 (*Echinochloa*-dominated with a *Typha* sub-component)

If nontidal: Is water present in channel? Yes

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: 1999 Regrowth Study -Berryessa u/s Lower Pen Sheets 2 and 3 (photo date 8/16/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	**c. Nonnative(s)**
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	51-75%	**26-50%**	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: This vegetation type was very similar to vegetation type 2, *Echinichloa*-dominated. This vegetation differed from type 2 in that the relative cover of *Echinochloa* was lower, near 50%, and the cover of *Typha latifolia* was greater, over 20%. Vegetation was found on very low benches nearly within the low-flow channel and on slightly higher benches adjacent to the channel. As in vegetation type 2, in those locations where the benches border the low-flow channel, the clayey soils were saturated nearly to the surface.

Estimated wetland amount: 0.52 ac

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	9/28/99
Location:	from Calaveras Blvd to Lower Penitencia Crk	**Investigator:**	Gale Rankin

Survey Chronology:	Post-Project Survey- 1st Year
Site Type:	RS, Excavation Study Site
Vegetation Type:	Non-tidal type 5 of 5 (Echinochloa-dominated with a Typha sub-component)

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
=20-50%	POACEAE	*Echinochloa crus-galli*	FACW	E
	TYPHACEAE	*Typha latifolia*	OBL	N
<20%	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	ASTERACEAE	*Aster subulatus var. ligulatus*	FACW	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	EQUISETACEAE	*Equisetum arvense*	FAC	N
	EUPHORBIACEAE	*Ricinis communis*	FACU	E
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	POACEAE	*Leptochloa fascicularis*	OBL	N
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Agrostis stolonifera*	FACW	E
	POLYGONACEAE	*Polygonum hydropiper*	OBL	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	SALICACEAE	*Salix laevigata*	NOL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 57

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa u/s Montague to Hwy 680	**Survey Date:** 6/28/99
Project/Activity: 1st Year post-SR project survey, Excavation Site	**Investigators:** G. Rankin; J. Hillman
Location:	Vegetation type 1: Fringing wetlands

If nontidal: Is water present in channel? Water (standing) was only present at the upstream end of the site on the concrete-bottom area just d/s of Highway 280.

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used:

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	**c. Nonnative(s)**
d. Cattail/bulrush mix	d. Other (describe)
e. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	51-75%	26-50%	**11-25%**	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: Narrow fringes of wetland plants bordered the open, flat, gravel channel bottom. These fringes were primarily located in the more upstream portion of the site. Downstream, occasional small patches or individual plants were located along the fringe, but these discontinuous clusters did not amount to sufficient cover to be considered wetland. Much of the downstream channel bed area was bordered by *Lolium multiflorum*, sometimes together with upland grasses. Such areas were also not considered wetland, although *Lolium* is ranked as a facultative species. Only where *Lolium* occurred together with other species indicative of wetlands (FACW or OBL species), was the vegetation considered to be wetland. Typical abundant species of the wetland fringe included *L. multiflorum*, *Polypogom monspeliensis*, *Lythrum californicum*, *Cyperus* *eragrostis*, *Agrostis viridis,* and *Epilobium ciliatum* ssp.. *ciliatum.* Relative percent native cover was generally toward the lower end of the 11-25% cover category.

Estimated wetland amount: 101x2, 173x2, 260x1, 237x1, 20x1. Total: 1065 sq. ft (0.02 ac)

Notes: A very dense and thick algal mat, about 3-6 inches deep, extended from bank to bank in much of the upstream portion of the site, except on higher gravel bars.

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	6/28/99
Location:	from Hwy 680 to Montague Expwy	**Investigator:**	Gale Rankin

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Excavation Study Site
Vegetation Type: 1: Friging wetland

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
<20%	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
	CHENOPODIACEAE	*Chenopodium sp.*	NOL	UNK
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Cynodon dactylon*	FAC	E
	POACEAE	*Leptochloa fascicularis*	OBL	N
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Lolium multiflorum*	NOL	E
	POACEAE	*Agrostis viridis*	OBL	E
	POLYGONACEAE	*Polygonum arenastrum*	FAC	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	PRIMULACEAE	*Anagallis arvensis*	FAC	E
	SCROPHULARIACEAE	*Mimulus guttatus*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 56

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa u/s Montague to Hwy 680	**Survey Date**: 6/28/99
Project/Activity: 1st Year post-SR project survey, Excavation Site	**Investigators**: G. Rankin; J. Hillman
Location:	Vegetation type 2: Instream bars

If nontidal: Is water present in channel? Water was only present at the upstream end of the site on the concrete-bottom area just d/s of Highway 280. Water was standing, not flowing.

Wetlands acreage estimates from: (a) map (b) photo (c) **field measure**

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	**c. Nonnative(s)**
d. Cattail/bulrush mix	d. Other (describe)
e. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	76-100%	51-75%	**26-50%**	11-25%	10% or less
Native species relative percent cover	76-100%	51-75%	26-50%	11-25%	**10% or less**
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: Three instream bars supported wetlands. Two were relatively small, and the third accounted for most of the wetland area. Vegetation was relatively sparse but variable on the 3 bars, and was nearer to the lower end of the 26-50% total percent cover category for the 3 bars overall. The species composition was well-mixed, however, *Polypogon monspeliensis* was the most abundant species overall, and the only species with relative cover amounts of at least 20%. Species of the site overall grew on the bars, including native and nonnative wetland and upland species such as *Cyperus eragrostis*, *Lythrum californicum*, *Echinochloa crus-galli*, and *Bromus diandrus*. Other bars also supported similar vegetation, however, the cover was too low (<10%) for these areas to be considered predominantly vegetated, and therefore were not considered to be wetland.

Estimated wetland amount: 11'x40', 33'x5', 160'x15' = 3005 sq. ft. (0.07 ac)

Notes: Standing water was present throughout the study reach on June 15, and dried up, except for the standing water at the uppermost end by the June 28.

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	6/28/99
Location:	from Hwy 680 to Montague Expwy	**Investigator:**	Gale Rankin

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Excavation Study Site
Vegetation Type: 2: Instream bars

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
=20-50%	POACEAE	*Polypogon monspeliensis*	FACW+	E
<20%	ASTERACEAE	*Artemisia californica*	UPL	N
	ASTERACEAE	*Sonchus oleraceus*	NI	E
	ASTERACEAE	*Lactuca serriola*	FAC	E
	ASTERACEAE	*Avena sp.*	NOL	E
	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
	BRASSICACEAE	*Brassica nigra*	UPL	E
	BRASSICACEAE	*Raphanus sativus*	UPL	E
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	JUNCACEAE	*Juncus bufonius*	FACW+	N
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Bromus diandrus*	NOL	E
	POACEAE	*Lolium multiflorum*	NOL	E
	POACEAE	*Agrostis viridis*	OBL	E
	TYPHACEAE	*Typha sp.*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 56

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: San Tomas Aquino Creek	**Survey Date**: 8/24-8/26/99
Project/Activity: 1st year post project survey: Excavation study site	**Investigator**: Janell Hillman
Location: u/s Great America Pkwy, to 785 ft u/s Hetch Hetchy pipeline	Vegetation Type 1 of 2

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: San Tomas Upstream Great America Pkwy, images 6-1, 6-2 and 5-1, 5-2; photo date 8/2/99

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	51-75%	**26-50%**	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list, digital photos (Disc 1 and 2)

Vegetation description:

There were two vegetation types present in the excavated portion of the project reach. Type 1 grew right along the creek banks. *Melilotus alba*, a facultative-upland species, and herbaceous wetland perennials such as Polygonum were co-dominant. *M. alba* provided overstory cover (close to 50% relative cover) and grew as a thick fringe along the lower slope of the open channel. At the water's edge, herbaceous species were dominant for a width of 1-3 ft, with *Polygonum* spp. providing 20-50%

relative cover. *Melilotus* was thick at the upper edge of this fringe and at this point other herbaceous wetland species such as *Polygonum* were found as an understory.

Soil was very silty and moist, along a steeply sloped bank. There were no benches at all above the bed of the channel. Wetland vegetation sloped down directly to the water's edge.

Comparison Summary:

All previously excavated banks showed a remarkable differentiation of regrowth vegetation from the non-impacted sections, with the thick overstory of *Melilotus alba* forming a prominent contrast to the mixed *Scirpus*-wetland transition community in the reference areas.

Topography was also very different, with the excavated areas of Vegetation Type 1 consisting mainly of a uniform slope of the bank to the channel at roughly a 45 degree angle. In contrast, the reference areas exhibited a varied topography, from sandy, slightly moist benches above the channel to in-stream, very moist silty islands. These in-stream islands were an artifact of the sediment removal operation, which in some cases did not remove all vegetation or sediment build-up. They were, in fact, similar to Vegetation Type 2 as well as Type 1, since it was a feature of these in-stream islands that wetland vegetation is expanding outward into both the excavation and reference sites.

Estimated wetland amount: 0.53 acre

SCVWD Wetlands Plant List

Facility Name:	San Tomas Aquino Creek	**Survey Start Date:**	8/24/99
Location:	from Great America Pkwy to u/s of Hetchy Hetchy pipes	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Excavation Study Site
Vegetation Type: Type 1 of 2: M wetland

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
=20-50%	FABACEAE	*Melilotus alba*	FACU+	E
	POLYGONACEAE	*Polygonum spp.*	NOL	N
<20%	APIACEAE	*Foeniculum vulgare*	FACU	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	ONAGRACEAE	*Epilobium sp.*	NOL	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Agrostis viridis*	OBL	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	SCROPHULARIACEAE	*Veronica anagallis-aquatica*	OBL	E
	TYPHACEAE	*Typha sp.*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 21

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: San Tomas Aquino	**Survey Date:** 8/24-8/26/99
Project/Activity: 1st year post project survey: Excavation study site	**Investigator**: Janell Hillman
Location: u/s Great America Pkwy to 785 ft u/s Hetch Hetchy pipes	Vegetation Type 2 of 2

If nontidal: Is water present in channel?
Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure
Maps or photos used: San Tomas Upstream Great America Pkwy, images 6-1, 6-2 and 5-1, 5-2; photo date 8/2/99

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list
Vegetation description:

There were two vegetation types present in the excavated portion of the project site. Vegetation Type 2 consisted of in-stream islands, mostly dominated by *Scirpus californicus* (>50% relative cover) and fringed by *Ludwigia peploides* and *Polygonum* spp. (20-50% relative cover combined). Many of these islands have developed from remnant wetland vegetation that was not removed during excavation. These islands support rooted vegetation that has since grown into the previously excavated areas.

Soil was very moist, with a lot of silt. Topography consisted mostly of low benches of varying widths which extended out of the channel above the water.

Estimated wetland amount: 0.53 acre

SCVWD Wetlands Plant List

Facility Name:	San Tomas Aquino Creek	**Survey Start Date:**	8/24/99
Location:	from Great America Pkwy to u/s of Hetchy Hetchy pipes	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Excavation Study Site
Vegetation Type: Type 2 of 2: B wetland

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	CYPERACEAE	*Scirpus californicus*	OBL	N
=20-50%	POLYGONACEAE	*Polygonum spp.*	NOL	N
<20%	APIACEAE	*Foeniculum vulgare*	FACU	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	BRASSICACEAE	*Lepidium latifolium*	FACW	I
	CHENOPODIACEAE	*Chenopodium ambrosioides*	FAC	E
	FABACEAE	*Melilotus alba*	FACU+	E
	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POLYGONACEAE	*Polygonum hydropiperoides*	OBL	N
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	SALICACEAE	*Populus fremontii*	FACW	N
	SCROPHULARIACEAE	*Veronica anagallis-aquatica*	OBL	E
	TYPHACEAE	*Typha angustifolia*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 21

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Sunnyvale East, Hwy 237 to Carribean Dr.	**Survey Date**: 9/15/99
Project/Activity: 1st year post project excavation site survey	**Investigator**: G. Rankin
Location: east bank	

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map **(b) photo** **(c) field measure**

Maps or photos used: 1999 Wetland Regrowth Study Sunnyvale East Sheet 1 (photo flight date 8/16/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): plant list

Vegetation description: The 1998 sediment removal project area on the east bank of the channel supported almost no wetland vegetation. Prior to excavation, wetland grew on a relatively flat sediment bench located between the bank slope and low flow channel. There is no sediment bench now. A small amount of wetland vegetation is present in a narrow, discontinuous fringe at the bottom edge of the vegetation on the steep, dry slope vegetation. This fringe is comprised primarily of *Polypogon monspeliensis* and *Polygonum punctatum*, which grades into dense, weedy upland typified by *Picris echioides* and *Lolium multiflorum*. This narrow fringe was not quantified or considered wetland due to it's small extent and marginal nature within the primarily upland vegetation.

At the upstream end of the site a few patches of *Scirpus pungens* grew near the base of the bank slope. These comprised approximately 300 square feet.

Estimated wetland amount: 302 sq. ft. (.01 ac)

Notes: The levees were raised in winter of 1998-99, increasing the steepness of the bank slopes.

SCVWD Wetlands Plant List

Facility Name: Sunnyvale East Channel

Location: from Hwy 237 to Caribbean Dr

Survey Start Date: 9/15/99

Investigator: Gale Rankin

Survey Chronology:

Site Type: RS, Excavation Study Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	CYPERACEAE	*Scirpus pungens*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 58

APPENDIX C
Adjacent Reference Site Checklists

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa	**Survey Date**: 9/21/99
Project/Activity: 1st year post project Adjacent Reference Site Survey	**Investigator**: G. Rankin
Location: Los Coches Ave. To Calaveras Rd.	Vegetation Type 1 of 2 - high wetland

If nontidal: Is water present in channel? Yes, water flowing rapidly

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: 1999 Wetland Regrowth: Berryessa Creek u/s Lower Penn. Sheet 4 (photo date 8/16/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	**c. Nonnative(s)**
d. Cattail/bulrush mix	d. Other (describe)
e. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	51-75%	**26-50%**	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): plant list

Vegetation description: This vegetation is located on a sandy sediment bench just downstream of the Los Coches bridge. The bench is broad and triangular upstream, then narrows and eventually disappears within about 200 feet downstream. The broad portion of the bench supports dense *Equisetum arvense*. The remainder of the bench is dominated by dense *Lolium multiflorum* and other nonnative herbs including *Picris echioides* and *Echinochloa crus-galli*. Although the bench was above the surface water level, the sandy soil was very moist. The extent of the bench and the marginal wetland it supports have increased since last year, although the extent of *Equisetum* has not increased.

Estimated wetland amount: 2309 sq. ft. (0.05 ac)

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	9/21/99
Location:	from Hwy 237 to Los Coches Ave	**Investigator:**	Gale Rankin

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Adjacent Reference Site
Vegetation Type: Type 1 of 2 - high wetland

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
=20-50%	POACEAE	*Lolium multiflorum*	NOL	E
<20%	APIACEAE	*Foeniculum vulgare*	FACU	E
	ASTERACEAE	*Conyza canadensis*	FAC	N
	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Lactuca serriola*	FAC	E
	ASTERACEAE	*Avena sp.*	NOL	E
	ASTERACEAE	*Agrostis sp.*	NOL	E
	ASTERACEAE	*Phalaris sp.*	NOL	UNK
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	BRASSICACEAE	*Raphanus sativa*	UPL	E
	EQUISETACEAE	*Equisetum arvense*	FAC	N
	EUPHORBIACEAE	*Ricinis communis*	FACU	E
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Avena fatua*	NOL	E
	POACEAE	*Piptatherum miliaceum*	NOL	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	SALICACEAE	*Salix laevigata*	NOL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 48

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa	**Survey Date**: 9/21/99
Project/Activity: 1st year post project Adjacent Reference Site Survey	**Investigator**: G. Rankin
Location: Los Coches Ave. To Calaveras Rd.	Vegetation Type 2 of 2 - low wetland

If nontidal: Is water present in channel? Yes, water flowing rapidly

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: 1999 Wetland Regrowth: Berryessa Creek u/s Lower Penn. Sheet 4 (photo date 8/16/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): plant list

Vegetation description: The "low" wetland vegetation occurred within the low-flow channel where surface water was still present, and on low, wet, benches just above the water. The vegetation consisted primarily of low-growing, native, wetland-obligate, herbs, with *Rorippa nasturtium-aquaticum* providing more than 50% of the relative cover. *Polygonum persicaria*, *P. lapathifolium*,and *Ludwigia peploides* were also common. Patches of slender-leaved cattail (*Typha angustifolia*) were scattered through the site. A narrow fringe of species such as *Picris*, *Polypogon monspeliensis*, and *Lolium* rim the wetland/upland interface. Approximately 10 saplings of *Salix laevigata* grew on-site. These were 6-10 ft. tall, and about 1-2' DBH. At least one individual sapling of *Salix lasiolepis* and *Salix exigua* were also present.

Estimated wetland amount: 0.11 ac

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	9/21/99
Location:	from Hwy 237 to Los Coches Ave	**Investigator:**	Gale Rankin

Survey Chronology:	Post-Project Survey- 1st Year
Site Type:	RS, Adjacent Reference Site
Vegetation Type:	Type 2 of 2 - Low wetland

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
<20%	ASTERACEAE	*Picris echioides*	FAC	E
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Piptatherum miliaceum*	NOL	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Lolium multiflorum*	NOL	E
	POACEAE	*Agrostis sp.*	NOL	E
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	SALICACEAE	*Salix exigua*	OBL	N
	SALICACEAE	*Salix laevigata*	NOL	N
	SALICACEAE	*Salix lasiolepis*	FACW	N
	TYPHACEAE	*Typha angustifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 50

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Jones Creek	**Survey Date**: 9/9/99
Project/Activity: 2nd year post project: Adjacent Reference Site	**Investigator**: Janell Hillman
Location: from instream concrete weir structure to 930 ft d/s	Vegetation Type 1 of 2

If nontidal: Is water present in channel? yes

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used: Yellow book map

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos Disc 7

Vegetation description:

This section of Jones Creek was dominated by *Polygonum punctatum* (greater than 50% relative cover), with *Atriplex triangularis* as sub-dominant (20-50% relative cover). *Epilobium ciliatum* was also common. This vegetation was broken up by occasional stands of mature *Salix* spp. and *Juglans californica*, which occurred on the lower part of the bank and often completely shaded the channel in these places and precluded any wetland vegetation in the understory. Vegetative cover was thick, in some places completely covering the channel bottom, and in others existing as a thick fringe along the bank margins. In areas of open water, the water remained motionless in the channel. There was some cover provided by the floating aquatic plant *Lemna* sp. Native species relative cover was right at the cusp of Category A and B, at less than 80%. In the more weedy areas, *Conium maculatum* was present in the wetland, with *Lepidium* common in the upland areas but not in the wetland itself.

Estimated wetland amount: 7038 sq. ft, or 0.16 acre

58 ft long x 8 ft wide, 10 ft long x 22 ft wide, 111 ft long x 2 ft wide , 27 ft long x 6 ft wide, 101 ft long x 26 ft wide, 54 ft long x 18 ft wide, 191 ft long x 12 ft wide, 8 ft long x 10 ft wide = 7038 sq. ft.; 0.16 acre

SCVWD Wetlands Plant List

Facility Name:	Jones Creek	**Survey Start Date:**	9/9/99
Location:	from 930 ft to 1860 ft d/s Hwy 152	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Adjacent Reference Site
Vegetation Type: Vegetation Type 1 of 2

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	POLYGONACEAE	*Polygonum punctatum*	OBL	N
=20-50%	CHENOPODIACEAE	*Atriplex triangularis*	FACW	N
<20%	APIACEAE	*Conium maculatum*	FACW	E
	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	BRASSICACEAE	*Raphanus sativa*	UPL	E
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	CYPERACEAE	*Scirpus maritimus*	OBL	N
	FABACEAE	*Melilotus alba*	FACU+	E
	JUGLANDACEAE	*Juglans californica var. hindsii*	FAC	N
	LAMIACEAE	*Mentha arvensis*	FACW	E
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Paspalum dilatatum*	FAC	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	TYPHACEAE	*Typha latifolia*	OBL	N

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[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 31

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Jones Creek	**Survey Date**: 9/9/99
Project/Activity: 2nd year post-project: Adjacent Reference Site	**Investigator**: Janell Hillman
Location: from concrete weir structure to 930 ft d/s	Vegetation Type 2 of 2

If nontidal: Is water present in channel? yes
Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**
Maps or photos used: Yellow book map

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	**a. Bulrush, cattail, burreed or**
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos Disc 7

Vegetation description:

This habitat type was dominated by *Typha latifolia*, with greater than 50% relative cover. In general, *Typha* cover was very thick and there was little understory of other species. Occasional other species that were present included *Polygonum punctatum* and *Atriplex triangularis*. Native species relative percent cover was very high.

Estimated wetland amount: 4954 sq. ft, or 0.11 acre
78 ft long x 6 ft wide, 52 ft long x 18 ft wide, 121 ft long x 22 ft wide, 37 ft long x 24 ft wide = 4954 sq. ft., 0.11 acre

SCVWD Wetlands Plant List

Facility Name:	Jones Creek	**Survey Start Date:**	9/9/99
Location:	from 930 ft to 1860 ft d/s Hwy 152	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Adjacent Reference Site
Vegetation Type: Vegetation Type 2 of 2

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	TYPHACEAE	*Typha latifolia*	OBL	N
<20%	APIACEAE	*Conium maculatum*	FACW	E
	CHENOPODIACEAE	*Atriplex triangularis*	FACW	N
	CYPERACEAE	*Scirpus californicus*	OBL	N
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POLYGONACEAE	*Polygonum punctatum*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 31

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Lower Penitencia	**Survey Date**: 10/6/99
Project/Activity: 2nd year post-project: adjacent reference site	**Investigator**: Janell Hillman
Location: from Milmont bridge to about 1925 feet (East Channel)	

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: Lower Penitencia d/s Milmont Dr., sheet 1, photo date 8/16/99; # C59196

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos disc 11

Vegetation description:

This site was dominated by *Scirpus californicus* (>50% relative cover). *Typha* was present and formed close to 20% cover, mostly at the upstream end of the sample site, where *T. angustifolia* was more common than *T. latifolia*. The invasive *Lepidium latifolium* grew thickly on the lower access road next to the wetland. It was also present in the wetland; however, it was not abundant there. There were also some occasional, scattered patches of *Scirpus robustus*.

Comparison summary:

Scirpus californicus is more abundant in the east channel this year than in the previous year. Conversely, *Typha* is less abundant. The low-growing herbaceous plants that were co-dominant last year (*Polygonum lapathifolium* and *Cynodon dactylon*) are also less abundant, following a pattern seen this year in the west (previously excavated) channel.

In general, the west (previously excavated) channel has a higher incidence of exotics, including *Lepidium*, which is invading the wetland edges. The east channel (adjacent reference site) seems to be trending towards monospecificity, with *Scirpus californicus* the overwhelming dominant there this year. Lepidium in the east channel wetlands does not exhibit greater than 5% relative cover.

Estimated wetland amount: 2.06 acres

SCVWD Wetlands Plant List

Facility Name:	Lower Penitencia Creek	**Survey Start Date:**	10/6/99
Location:	from Milmont Dr. d/s approx. 1900 ft	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Adjacent Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	CYPERACEAE	*Scirpus californicus*	OBL	N
<20%	APIACEAE	*Foeniculum vulgare*	FACU	E
	ASTERACEAE	*Euthamia occidentalis*	OBL	N
	BRASSICACEAE	*Lepidium latifolium*	FACW	I
	CAPRIFOLIACEAE	*Sambucus mexicana*	FAC	N
	CHENOPODIACEAE	*Atriplex triangularis*	FACW	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	CYPERACEAE	*Scirpus robustus*	OBL	N
	LAMIACEAE	*Mellisa officinales*	NOL	E
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	PLATANACEAE	*Platanus racemosa*	FACW	N
	POACEAE	*Phalaris aquatica*	FAC+	E
	POACEAE	*Cynodon dactylon*	FAC	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Agrostis viridis*	OBL	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	SALICACEAE	*Salix exigua*	OBL	N
	SALICACEAE	*Populus fremontii*	FACW	N
	SALICACEAE	*Salix laevigata*	NOL	N
	SALICACEAE	*Salix lasiolepis*	FACW	N
	SOLANACEAE	*Solanum sp.*	NOL	E
	TYPHACEAE	*Typha angustifolia*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N
	URTICACEAE	*Urtica dioica ssp. holosericea*	FACW	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 37

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Lions Creek	**Survey Date**: 9/7/99
Project/Activity: Adjacent Reference Site for North Morey Channel	**Investigator**: Janell Hillman
Location: from Kern Ave. bridge to 1000 ft d/s	

If nontidal: Is water present in channel? yes

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used:

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	**a. Bulrush, cattail, burreed or**
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos Disc 6

Vegetation description:

Both *Typha latifolia* and *T. angustifolia* were dominant (each with 20-50% relative cover) and provided over 50% relative cover collectively. Total vegetative cover was very thick, with some occasional patches of open water. There were several 50 foot long breaks in this thick cover of *Typha* spp., where *Cyperus eragrostis* instead formed dense cover from the bank margins and into the channel, and *Ludwigia peploides* carpeted the channel's centerl. *L. peploides* was also present in places as an understory to the *Typha.* Due to the thick cover and unusual composition of the *Typha* and *Cyperus-Ludwigia* mix, relative cover of both *C. eragrostis* and *L. peploides* was in the 20-50% category. The upstream section of the channel near Kern Ave. was more weedy than downstream portions.

Estimated wetland amount:
1000ft long x 25 ft wide @ 95% cover of wetland = 23750 sq. ft., or 0.55 acre

SCVWD Wetlands Plant List

Facility Name:	Lions Creek	**Survey Start Date:**	9/7/99
Location:	from Kern Ave d/s 1000 ft	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Adjacent Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
=20-50%	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	TYPHACEAE	*Typha angustifolia*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N
<20%	ALISMATACEAE	*Alisma lanceolatum*	OBL	E
	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	SALICACEAE	*Salix laevigata*	NOL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 29

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: San Tomas Aquino Creek	**Survey Date**: 9/15/99
Project/Activity: Adjacent Reference	**Investigator**: LS
Location: Hwy 237 Footbridge[1] to 750 ft. d/s	Vegetation Type 1 of 2 - Low Wetland

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map (b) **photo** (c) field measure

Maps or photos used: San Tomas Creek d/s Great America Parkway, Sheet 1, Color (flown 8/2/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. **Cattail**	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: Vegetation was separated into two categories on this site: low marsh dominated by tall perennial emergent vegetation (vegetation type 1) and high marsh dominated by wetland grasses and forbs (vegetation type 2).

The low marsh cover was a dense (100% total cover) mixed stand of *Typha domingensis* and *Scirpus californicus*. While *S. californicus* occurred as monospecific patches in some locations and was abundant throughout the site (30% relative cover overall), *T. domingensis* was the dominant species (>50% cover). A large number of species occurred sparsely throughout the site. Of those, *Urtica dioica ssp. holosericea*, *Euthamia occidentalis*, and *Scirpus maritimus* were the next most abundant species comprising approximately 15% relative cover, collectively. Although *Lepidium latifolium* and *Arundo* *donax* were present in the wetland, their occurrence was <<5% collectively in the low marsh community.

Wetland occurred as wide benches on both sides of the channel. The east bench was fairly uniform in elevation, while the topography of the wider west bench was more variable. Several stretches of the west bank wetland had uneven microtopographic relief resulting in intermixed ponding and soil saturation across the surface at high tide. This resulted in a matrix of low and high vegetation types that were difficult to distinguish on the aerial photograph and to delineate in the field.

Estimated wetland amount: Approximately 90% is estimated to comprise the low wetland (Site total: **1.32 acres**) .

Notes:

There are no apparent changes at the site since the 1998 surveys, except for a shift in dominance from *S. californicus* to *T. domingensis*. Any differences in acreage between 1998 and 1999 can probably be attributed to calculating wetland acreage from aerial photos rather than field estimates.

[1] The location description more accurately identifies the u/s end of the site than the 1998 description.

Instream Wetlands Plant Checklist - SCVWD Maintenance Program

Stream/Location/Project: San Tomas Adjacent Tidal Reference Veg Type 1 of 2 Date: 9/15/99

FAMILY NAME		**SPECIES** (**Bold = Native P= Pest or invasive**)	**INDICATOR STATUS**	REL. COV. (%)		
				<20	20-50	> 50
APIACEAE		*Apium graveolens*	FACW+	X		
ASTERACEAE		***Euthamia occidentalis***	**OBL**	X		
BRASSICACEAE	P	*Lepidium latifolium*	FACW	X		
CYPERACEAE		***Cyperus eragrostis***	**FACW**	**X**		
CYPERACEAE		***Scirpus californicus***	**OBL**		**X**	
CYPERACEAE		***Scirpus robustus***	**OBL**	**X**		
EQUISETACEAE		***Equisetum arvense***	**FAC**	X		
ONAGRACEAE		***Epilobium ciliatum ssp. cilatum***	**FACW**	**X**		
ONAGRACEAE		***Ludwigia peploides ssp. peploides***	**OBL**	**X**		
POACEAE	P	*Arundo donax*	FACW	X		
POACEAE		*Cynodon dactylon*	FAC	X		
POACEAE		*Echinochloa crus-galli*	FACW	X		
POACEAE		*Paspalum dilatatum*	FAC	X		
POACEAE		*Phalaris aquatica*	FAC+	X		
POLYGONACEAE		***Polygonum hydropiperoides***	**OBL**	X		
POLYGONACEAE		***Polygonum lapathifolium***	**OBL**	X		
POLYGONACEAE		*Polygonum persicaria*	FACW	X		
POLYGONACEAE		***Polygonum punctatum***	**OBL**	X		
SALICACEAE		***Salix lasiolepis***	**FACW**	**X**		
TYPHACEAE		***Typha domingensis***	**OBL**			**X**
URTICACEAE		***Urtica dioica ssp. holosericea***	**FACW**	X		

Additional Comments:

NI = listed but no wetland status indicated

NOL = not on list

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: San Tomas Aquino Creek	**Survey Date**: 9/15/99
Project/Activity: Adjacent Reference	**Investigator**: LS
Location: Hwy 237 Footbridge[1] to 750 ft. d/s	Vegetation Type 2 of 2 - High Wetland

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map (b) **photo** (c) field measure

Maps or photos used: San Tomas Creek d/s Great America Parkway, Sheet 1, Color (flown 8/2/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. **Other native**	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: Vegetation was separated into two categories on this site: low marsh dominated by tall perennial emergent vegetation (vegetation type 1) and high marsh dominated by wetland grasses and forbs (vegetation type 2).

The high marsh cover was a dense (100% cover) community dominated by *Leymus triticoides (40%)* with subdominants *Euthamia occidentalis* (15% relative cover) and *Mentha x piperita* (15% relative cover) occurring primarily as large patches. Other species present included *Agrostis viridis* (10% relative cover) and other less common species (*Polypogon monspeliensis*, *Agrostis stolonifera*, and *Scirpus Californica*).

The high marsh occurred as several patches within the low marsh[2]. The topography in these areas was highly variable. The uneven microtopographic relief resulted intermixed ponding and soil saturation across the surface at high tide.

Estimated wetland amount: Approximately 10% is estimated to comprise the low wetland (Site total: **0.07 acres**).

Notes:

[1] The location description more accurately identifies the u/s end of the site than the 1998 description.

[2] The high marsh areas were not observed in the 1998 survey. The area, however, was included in the wetland area calculation. It is unlikely that they are features that have developed since the last survey. More likely, they are areas that were overlooked because the dominant vegetation surrounding these areas is high in stature and difficult to penetrate in many locations. These areas were not observable from the levee in 1998 and my survey transects did not bisect them. Delineation of these areas on the photo in 1999 was made difficult because the boundaries between the vegetation types was not easily distinguished. Delineation of their boundaries was facilitated using field measurements.

Instream Wetlands Plant Checklist - SCVWD Maintenance Program

Stream/Location/Project: San Tomas Acquino Tidal Adjacent Reference Veg Type 2 oDate: 9/15/99

FAMILY NAME		**SPECIES** (Bold = Native P= Pest or invasive)	**INDICATOR STATUS**	REL. COV. (%)		
				<20	20-50	> 50
APIACEAE		*Apium graveolens*	FACW+	X		
ASTERACEAE		***Bidens frondosa***	**FACW**	**X**		
ASTERACEAE		***Euthamia occidentalis***	**OBL**	**X**		
CYPERACEAE		***Scirpus californicus***	**OBL**	**X**		
CYPERACEAE		***Scirpus maritimus***	**OBL**	**X**		
LAMIACEAE		*Mentha x piperita*	**OBL**	X		
POACEAE		*Agrostis stolonifera*	FACW	X		
POACEAE		*Agrostis viridis*	OBL	X		
POACEAE	P	*Arundo donax*	FACW	X		
POACEAE		***Leersia oryzoides***	**OBL**	**X**		
POACEAE		***Leymus triticoides***	**FAC**		**X**	
POACEAE		*Paspalum dilatatum*	FAC	X		
POACEAE		***Paspalum distichum***	**OBL**	**X**		
POACEAE		*Phalaris aquatica*	FAC+	X		
POACEAE		*Piptatherum miliaceum*	NOL	X		
POACEAE		*Polypogon monspeliensis*	FACW+	X		
SALICACEAE		***Salix lasiolepis***	**FACW**	**X**		
TYPHACEAE		***Typha domingensis***	**OBL**	**X**		
URTICACEAE		***Urtica dioica ssp. holosericea***	**FACW**	**X**		

Additional Comments: NI = listed but no wetland status indicated

NOL = not on list

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Saratoga Creek	**Survey Date:** 9/8/99
Project/Activity: 2nd post project Adjacent Reference Site Survey	**Investigator:** G. Rankin
Location: U/S Warburton Ave.	

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: 1999 Wetland Regrowth Study Saratoga Creek Sheet 2 (flight date 9/8/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): plant species list

Vegetation description: The channel bed was nearly 100% vegetated. *Ludwigia peploides* was the most abundant species, with over 50% relative cover. *Rorippa nasturtium-aquaticum* and *Polygonum persicaria* were the next most abundant species, respectively. Other species present in low abundance included *Veronica anagallis aquatica, Cyperus eragrostis*, and *Epilobium ciliatum*. A few small patches of *Typha angustifolia* were present. *Paspalum dilatatum* rimmed much of the upland-wetland fringe. Surface water was present across the entire channel bed, and was mostly less than 6" deep.

Estimated wetland amount: 0.59 ac

Notes: The cobbles were mostly <2" in diameter.

SCVWD Wetlands Plant List

Facility Name:	Saratoga Creek	**Survey Start Date:**	9/8/99
Location:	from Warburton to 120 ft d/s El Camino	**Investigator:**	Gale Rankin

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Adjacent Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
=20-50%	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
<20%	APIACEAE	*Foeniculum vulgare*	FACU	E
	ASTERACEAE	*Bidens frondosa*	FACW	N
	ASTERACEAE	*Lactuca serriola*	FAC	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	CHENOPODIACEAE	*Chenopodium sp.*	NOL	UNK
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	EQUISETACEAE	*Equisetum arvense*	FAC	N
	FABACEAE	*Melilotus alba*	FACU+	E
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Paspalum dilatatum*	FAC	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	SCROPHULARIACEAE	*Veronica anagallis-aquatica*	OBL	E
	TYPHACEAE	*Typha angustifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 53

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: South Morey Channel	**Survey Date**: 9/7/99
Project/Activity: Adjacent Reference Site	**Investigator**: Janell Hillman
Location: from 830 ft d/s Santa Theresa Blvd to 1660 ft d/s (see notes)	

If nontidal: Is water present in channel? yes

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used:

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	**a. Bulrush, cattail, burreed or**
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos Disc 5

Vegetation description:

This section of South Morey was dominated almost completely by *Typha latifolia* and *Typha angustifolia*, each with 20-50% relative cover. Total vegetative cover was thick and continuous, but there were occasional patches of open water. *Scirpus californicus* was present at the upstream extent of the sample site but in quantities of less than 20% relative cover. The floating aquatic plant *Lemna* sp. was present in areas of open water.

Comparison summary:

Conditions were very similar to last year, although the occasional open patches of water noted during this year's surveys were not observed last year.

Estimated wetland amount: 13718 sq. ft., or 0.32 acre
760 ft long x 19 ft wide @ 95% wetland = 13718 sq. ft.

Notes: A bridge, presently under construction and spanning both North and South Morey Channels, has impacted wetlands in the channel for a length of about 200 feet (from 700 ft d/s Santa Theresa Blvd to 900 ft d/s on South Morey). This impacts the first 70 feet of the Adjacent Reference Site on South Morey Channel (please see North and South Morey Excavation Study Site checklists for further details).

SCVWD Wetlands Plant List

Facility Name:	South Morey Channel	**Survey Start Date:**	9/7/99
Location:	from 830 ft to 1660 ft d/s Santa Theresa Blvd	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Adjacent Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
=20-50%	TYPHACEAE	*Typha angustifolia*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N
<20%	CYPERACEAE	*Scirpus californicus*	OBL	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	POACEAE	*Paspalum dilatatum*	FAC	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 27

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa	**Survey Date**: 9/16/99
Project/Activity: 1st year post-project-adjacent reference site	**Investigator**: Janell Hillman
Location: from Montague Expwy downstream, to 2nd railroad trestle	

If nontidal: Is water present in channel? d/s of railroad trestle, yes. Upstream of 1st trestle, no.

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used:

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos Disc 8 and 9

Vegetation description:

The vegetation was composed predominantly of *Rorippa nasturtium-aquaticum* (>50% relative cover), which was most common d/s of the 1st railroad trestle. Mixed native and non-native grasses, such as *Agrostis*, *Polypogon interruptus*, and *Paspalum distichum*, were sub-dominant (20-50% relative cover collectively). *Polygonum persicaria* and *Cyperus eragrostis* were common but at less than 20% cover. The channel bed between Montague Expressway and the first railroad trestle was only slightly moist, with wetland vegetation still present but containing a higher incidence of slightly drier and/or weedier species such as *Cyperus eragrostis* and *Polypogon monspeliensis*. In this section wetland vegetation rarely spanned the bed of the channel, existing instead as a moderately thin fringe along either side. Downstream of the first railroad trestle the channel bed did contain water, which flowed from a nearby outfall pipe. Here *Rorippa* was especially common along with the various grasses. There were occasional clusters of *Typha angustifolia* and *Veronica anagallis-aquatica*.

Soil was gravelly and moist. For the most part, total cover was quite high (76-100%). Native species comprised 51-75% relative cover, with more weeds occurring u/s of the first railroad trestle in the section of the creek that was drier.

Estimated wetland amount: 16050 sq. ft., or 0.37 acre

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	9/16/99
Location:	from Montague Expwy d/s to 2nd railroad bridge	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 2nd Year
Site Type: RS, Adjacent Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
<20%	AMARANTHACEAE	*Amaranthus retroflexus*	FACU	E
	ASTERACEAE	*Artemisia douglasiana*	FACW	N
	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Gnaphalium luteo-album*	FACW-	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	CHENOPODIACEAE	*Chenopodium ambrosioides*	FAC	E
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	EQUISETACEAE	*Equisetum arvense*	FAC	N
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	MALVACEAE	*Malva sp.*	NOL	E
	PLATANACEAE	*Platanus racemosa*	FACW	N
	POACEAE	*Avena barbata*	NOL	E
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Cynodon dactylon*	FAC	E
	POACEAE	*Paspalum distichum*	OBL	N
	POACEAE	*Leptochloa fascicularis*	OBL	N
	POACEAE	*Polypogon interruptus*	OBL	E
	POACEAE	*Piptatherum miliaceum*	NOL	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Agrostis stolonifera*	FACW	E
	POACEAE	*Agrostis viridis*	OBL	E
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	SALICACEAE	*Salix laevigata*	NOL	N
	SCROPHULARIACEAE	*Veronica anagallis-aquatica*	OBL	E
	TYPHACEAE	*Typha angustifolia*	OBL	N

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[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 34

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: San Tomas Aquino Creek	**Survey Date**:8/24-8/26/99
Project/Activity: 1st year post-project: Adjacent Reference site	**Investigator**: Janell Hillman
Location: u/s Great America Pkwy to 785 ft u/s Hetch Hetchy pipeline	

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: San Tomas Upstream Great America Pkwy, images 6-1, 6-2 and 5-1, 5-2; photo date 8/2/99

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list, digital photos (Disk 1 and 2)

Vegetation description:

This vegetation was found in all adjacent reference areas (areas that were not impacted by sediment removal) and occurred along banks and on in-stream islands. Primary dominance was provided by *Scirpus californicus* (>50% relative cover), with an herbaceous component as well.

Two "subtypes" were present here, which were not called out or mapped as separate types due to the amount of intermixing of vegetation and mosaic patterning of the types. The intermixing of vegetation made it difficult to cleanly define the types for comparison purposes. In general, the moister areas, dominated by *S. californicus* and fringed by species such as *Polygonum* spp.(20-50% relative cover) and *Ludwidgia peploides*, occurred on low bars near the channel bed. Substrate consisted of silt and clay. In the drier (but still moist), sandier, high bench areas (sometimes located up to 4 feet above the channel bed), a mix of native and weedy or facultative species such as *Piptatherum milliaceum* (approaching 20% cover), *Equisetum arvense*, and *Chenopodium ambrosioides* existed with lower quantities of *S. californicus*. These areas were still considered to be wetland, although they are closer to the upland boundary.

Estimated wetland amount: 1.60 acre

SCVWD Wetlands Plant List

Facility Name:	San Tomas Aquino Creek	**Survey Start Date:**	8/24/99
Location:	from Great America Pkwy to u/s of Hetchy Hetchy pipes	**Investigator:**	Janell Hillman

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Adjacent Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	CYPERACEAE	*Scirpus californicus*	OBL	N
=20-50%	POLYGONACEAE	*Polygonum spp.*	NOL	N
<20%	APIACEAE	*Foeniculum vulgare*	FACU	E
	ASTERACEAE	*Gnaphalium luteo-album*	FACW-	E
	ASTERACEAE	*Euthamia occidentalis*	OBL	N
	ASTERACEAE	*Helenium puberulum*	FACW	N
	ASTERACEAE	*Lactuca serriola*	FAC	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	BRASSICACEAE	*Lepidium latifolium*	FACW	I
	BRASSICACEAE	*Brassica nigra*	UPL	E
	CHENOPODIACEAE	*Chenopodium ambrosioides*	FAC	E
	CHENOPODIACEAE	*Atriplex triangularis*	FACW	N
	CYPERACEAE	*Scirpus robustus*	OBL	N
	EQUISETACEAE	*Equisetum arvense*	FAC	N
	FABACEAE	*Melilotus alba*	FACU+	E
	JUGLANDACEAE	*Juglans californica var. hindsii*	FAC	N
	LAMIACEAE	*Mentha spicata*	OBL	E
	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	POACEAE	*Phalaris aquatica*	FAC+	E
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Cynodon dactylon*	FAC	E
	POACEAE	*Paspalum dilatatum*	FAC	E
	POACEAE	*Paspalum distichum*	OBL	N
	POACEAE	*Leptochloa fascicularis*	OBL	N
	POACEAE	*Piptatherum miliaceum*	NOL	E
	POACEAE	*Agrostis viridis*	OBL	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	POLYGONACEAE	*Polygonum hydropiperoides*	OBL	N
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	SALICACEAE	*Populus fremontii*	FACW	N
	SALICACEAE	*Salix sp.*	NOL	N
	SCROPHULARIACEAE	*Veronica anagallis-aquatica*	OBL	E
	SOLANACEAE	*Solanum sp.*	NOL	E
	TYPHACEAE	*Typha angustifolia*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N
	URTICACEAE	*Urtica dioica ssp. holosericea*	FACW	N

Code: 22

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[1] N = Native, E = Exotic, I = Invasive Exotic

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Sunnyvale East	**Survey Date**: 9/15/99
Project/Activity: 1st year post project adjacent reference site survey	**Investigator**: G. Rankin
Location: Hwy 237 to Carribean Dr. - west bank	

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: 1999 Wetland Regrowth Study Sunnyvale East Sheet 1 (flight date 8/16/99)

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): plant species list

Vegetation description: Wetland vegetation grew, as last year, on the sediment bench located between the open channel and steep bank slope. The bench was absent from just downstream of Carribean Dr. and just upstream of Highway 237, where sediment was removed in 1998. Two native species, *Ludwigea peploides* and *Polygonum punctatum* each had greater than 20% relative cover. These typically grew in monodominant patches, with *Luwidgea* growing at lower elevations, including areas where it had expanded into what was otherwise open channel. Non-native grasses also were prevalent on the site, and formed numerous discrete patches. These included *Agrostis stolonifera* and *Polypogon* sp. Non-native species relative percent cover was just slightly less than that of native species.

Estimated wetland amount: 0.36 ac

Notes: In 1997 the total amount of wetland in the reference site was determined by multiplying average wetland width (5 ft.) by total site length (2500 ft. as determined by yellow book. Note: total length as measured from the 1999 aerial photo is 2520). However, the 1999 photograph indicates that 680 feet the reference site near each bridge was excavated in 1998. The amount of wetland excavated was 5X680 = 3200 sq. ft. Therefore, the amount of wetland in the reference area in 1999 should be corrected from 12,500 (0.29 ac) to 9300 (0.21 ac).

SCVWD Wetlands Plant List

Facility Name:	Sunnyvale East Channel	**Survey Start Date:**	9/15/99
Location:	from Hwy 237 to Caribbean Dr	**Investigator:**	Gale Rankin

Survey Chronology: Post-Project Survey- 1st Year
Site Type: RS, Adjacent Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin [1]
=20-50%	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	POACEAE	*Sorghum bicolor*	FAC	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
<20%	ASTERACEAE	*Picris echioides*	FAC	E
	BRASSICACEAE	*Lepidium latifolium*	FACW	I
	CHENOPODIACEAE	*Atriplex triangularis*	FACW	N
	CYPERACEAE	*Scirpus californicus*	OBL	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	CYPERACEAE	*Scirpus pungens*	OBL	N
	CYPERACEAE	*Scirpus robustus*	OBL	N
	MALVACEAE	*Malva sp.*	NOL	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Agrostis sp.*	NOL	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	POLYGONACEAE	*Polygonum persicaria*	FACW	E

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 54

APPENDIX D
General Reference Site Checklists

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Berryessa Creek	**Survey Date**: 10/13/99
Project/Activity: General Reference Site	**Investigator**: Janell Hillman
Location: from 1500 ft u/s Los Coches Ave to 215 ft farther u/s	

If nontidal: Is water present in channel? yes

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used: Yellow book map

Dominance (>50% Relative Cover)	
Tidal	Nontidal
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	**d. Other (describe)**
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	76-100%	51-75%	**26-50%**	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos disc 12

Vegetation description:

This site was dominated by a mixture of monocot herbs and grasses, with no one species predominating. Common species included *Cynodon dactylon*, *Cyperus eragrostis*, *Agrostis viridis*, and *Typha latifolia*. *Ludwigia peploides* and *Rorippa nasturtium-aquaticum* were present in the channel but did not look very robust. Native species relative cover was at the low end of the 51-75% category. Total percent cover of the wetland was evaluated for the width of the entire channel due to its patchiness, and fell within the 26-50% category.

The water within the channel was clear and running; however, the *Typha* present on the site had yellowed leaves and looked unhealthy. In general, wetland vegetation on this site did not look that healthy; the *Rorippa nasturtium-aquaticum* had small leaves and a large number of exposed roots while the *Ludwigia peploides* had yellowed leaves and exposed stems.

Qualitative observations indicated slightly more wetland vegetation located downstream in the unsampled portion of the creek.

Comparison summary:

The vegetation occurred more or less continuously throughout the channel but at low cover, which prompted the evaluation of the entire channel rather than describing occasional patches of vegetation within it. This helps to explain the much lower total percent cover value this year than was seen in the previous year's assessment. Another interesting feature noted which contributed to the low overall cover value was that the vegetation looked less healthy this year, although the water was clear and running.

Estimated wetland amount: 1502 sq. ft., or 0.03 acre

11ft x 39ft, 1ft x 21ft, 5ft x 15ft, 10ft x 22ft, 2ft x 31ft, 8ft x 15ft, 5ft x 15ft, 10ft x 50ft

SCVWD Wetlands Plant List

Facility Name:	Berryessa Creek	**Survey Start Date:**	10/13/99
Location:	1500 ft u/s Los Coches Ave; length 215 ft	**Investigator:**	Janell Hillman

Survey Chronology:
Site Type: RS, General Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
<20%	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	CYPERACEAE	*Scirpus robustus*	OBL	N
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	POACEAE	*Cynodon dactylon*	FAC	E
	POACEAE	*Leptochloa fascicularis*	OBL	N
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Agrostis viridis*	OBL	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	TYPHACEAE	*Typha angustifolia*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: E. Little Llagas @ Sta. 45+00	**Survey Date**: 10/7/99
Project/Activity: General Reference Site	**Investigator**: G. Rankin
Location: Begins 300' d/s of /ds end of confluence with San Martin Creek	

If nontidal: Is water present in channel? No

Wetlands acreage estimates from: (a) map (b) photo (c) field measure

Maps or photos used:

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	B	C	D	E
Total percent cover	76-100%	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	5% or less	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: No wetlands present. The banks and bench adjacent to the incised low-flow channel were vegetated primarily with *Avena* sp. Other component species included *Epilobium brachycarpum* and *Plantago lanceolata*. The lower bench areas comprise *Lolium multiflorum*, *Lactuca serriola*, *Brassica nigra*, *Cicorium intybus*, and *Rumex crispus*. Scattered individuals of *Xanthium strumarium* and *Polygonum* (possibly *lapathifolium*) were present in the channel bottom. *Polypogon monspeliensis* clusters, less than 2' in width, were also occasionally present.

Estimated wetland amount: None

Notes:

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Fisher Creek @ Sta. 149+00	**Survey Date**: 10/7/99
Project/Activity: General Reference Site	**Investigator**: G. Rankin
Location: 500 ft. d/s Laguna Road	

If nontidal: Is water present in channel? Yes, 3-4" deep, ponded or very slow moving.

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used:

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: Most of the channel was completely vegetated bank to bank with dense *Typha angustifolia*. Near the upstream end, an approximately 20 foot long segment was devoid of *Typha*. Instead, the vegetation was dominated by *Polygonum punctatum*. *Ludwigia peploides* was also present here. *Polygonum*, *Epilobium ciliatum*, and *Picris echioides* grew along the upper fringes.

Estimated wetland amount: 13'x100 = 1300' (0.03 ac, the entire channel from bank to bank)

Notes:

SCVWD Wetlands Plant List

Facility Name:	Fisher Creek	**Survey Start Date:**	10/7/99
Location:	500 ft d/s Laguna Rd; length 100 ft	**Investigator:**	Gale Rankin

Survey Chronology:
Site Type: RS, General Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	TYPHACEAE	*Typha angustifolia*	OBL	N
<20%	ASTERACEAE	*Picris echioides*	FAC	E
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
	POLYGONACEAE	*Polygonum punctatum*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 46

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Greystone Creek	**Survey Date**: 10/8/99
Project/Activity: General Reference Site	**Investigator**: Janell Hillman
Location: 500 ft u/s of Camden Ave; sample length 210 ft.	

If nontidal: Is water present in channel? yes

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used: Yellow book map

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	76-100%	51-75%	**26-50%**	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos disc 11

Vegetation description:

Conditions on site consisted of a narrow channel with discontinuous clumps of wetland vegetation of moderate cover. Several large landscape trees overhung and shaded portions of the channel.

Vegetation was dominated by *Rorippa nasturtium-aquaticum* (>50% relative cover). In addition, there was a sub-dominant mixed herbaceous monocot category, comprising 20-50% relative cover, which included *Cyperus eragrostis*, *Cynodon dactylon*, and *Polypogon* sp. The water was stagnant in some places, with a light algal bloom. Native species relative cover was fairly high, at 51-75%.

Comparison summary:

Wetland vegetative cover is much lower than in the previous year; especially the *Rorippa* cover. This could be due to shading (the channel was shaded at time of survey; however, trees were also present last year when wetland had higher cover). Nowhere has *Rorippa* looked healthy this year. Also, there is a much higher incidence of mixed monocots.

Estimated wetland amount: 425 sq. ft., or 0.01 acre
5ft wide x 20ft long channel @ 40% wetland = 40 sq. ft.
1ft x 32ft, 4ft x 11ft, 3ft x 24ft, 1ft x 30ft, 2ft x 15ft, 3ft x 15ft, 4ft x 33ft = 385 sq. ft.

SCVWD Wetlands Plant List

Facility Name:	Greystone Creek	**Survey Start Date:**	10/8/99
Location:	500 ft u/s Camden Ave; length 210 ft	**Investigator:**	Janell Hillman

Survey Chronology:
Site Type: RS, General Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	BRASSICACEAE	*Rorippa nasturtium-aquaticum*	OBL	N
<20%	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Cynodon dactylon*	FAC	E
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Agrostis viridis*	OBL	E
	POLYGONACEAE	*Polygonum persicaria*	FACW	E

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 41

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Tularcitos Creek	**Survey Date**: 10/7/99
Project/Activity: General Reference Site	**Investigator**: Janell Hillman
Location: From Shetland Ct. to 380 ft d/s	

If nontidal: Is water present in channel? yes

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used: Yellow book map

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos disc 11

Vegetation description:

The wetland on site was continuous and grew bank to bank in a very channelized creek with levys sloping steeply and uniformly to the channel bed. Total vegetative cover in the sample site was very high (100%). *Ludwigia peploides* predominated, with greater than 50% relative cover. A cover of mixed monocot emergents were sub-dominant and included *Typha latifolia*, *Leptochloa fascicularis*, and *Scirpus maritimus* (20-50% relative cover for all combined). Native species relative percent cover was high (76-100%). The *Ludwigia* was sending runners (long, lateral stems and leaves) about one foot in length up the levy slopes from the channel bed. These runners were not included in the wetland acreage calculations because they were not rooted and soil was unsaturated.

Comparison summary:

The *Ludwigia* looked much healthier than in the previous year, when a brown fringe of the vegetation lined the channel sides and only the center of the bed was green. Although at the time of survey this year *Ludwigia* was still the overwhelmingly dominant species, a community of mixed monocot emergents are coming in, and form a sub-dominant cover class.

The *Scirpus* noted in this year's assessment is *S. maritimus*, in contrast to *S. robustus* in the previous year. It is possible that the two are hybridizing. Some culms were found without the diagnostic triangular veinless area on the sheath. (Similarly, it is interesting that *Typha latifolia* rather than *T. angustifolia* was common during this year's survey.)

Estimated wetland amount: 380 ft long x 19ft wide = **7220 sq. ft., or 0.17 acre**

SCVWD Wetlands Plant List

Facility Name:	Tularcitos Creek	**Survey Start Date:**	10/8/99
Location:	from Shetland Ct d/s 380 ft	**Investigator:**	Janell Hillman

Survey Chronology:
Site Type: RS, General Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	ONAGRACEAE	*Ludwigia peploides ssp. peploides*	OBL	N
<20%	ASTERACEAE	*Cirsium vulgare*	FACU	E
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	CYPERACEAE	*Scirpus maritimus*	OBL	N
	LYTHRACEAE	*Lythrum californicum*	OBL	N
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POACEAE	*Leptochloa fascicularis*	OBL	N
	POACEAE	*Polypogon monspeliensis*	FACW+	E
	POACEAE	*Agrostis viridis*	OBL	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 38

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Lower Silver Creek	**Survey Date**: 10/13/99
Project/Activity: General Reference Site	**Investigator**: Janell Hillman
Location: 250 ds of Silver Creek Rd; length 105 ft	

If nontidal: Is water present in channel? yes

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used: Yellow book map

Dominance (>50% Relative Cover)	
Tidal	Nontidal
a. Alkali bulrush	**a. Bulrush, cattail, burreed or**
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos disc 11

Vegetation description:

Site conditions consisted of a thickly-vegetated channel about 16 feet wide. Vegetation was dominated by *Typha latifolia* (barely greater than 50% relative cover). Sub-dominant was *Echinochloa crus-galli* (20-50% relative cover). Native species relative cover was at the low end of 51-75%. Total cover was about 95%, with some patches of open water.

The un-sampled section just downstream of the general reference site was toe-to-toe *Ludwigia peploides* in the channel, except for occasional patches of *Typha*.

Comparison summary:

This site has changed dominance from *Echinochloa crus-galli* to *Typha latifolia*, which in the previous year's assessment was present but at very low cover values. The establishment of *Typha* has increased the native species relative cover, shifting the vegetation quality indicator up one category.

Estimated wetland amount:
16ft wide x 105ft long: 1680 sq. ft.; or 0.04 acre

SCVWD Wetlands Plant List

Facility Name:	Lower Silver Creek	**Survey Start Date:**	10/13/99
Location:	250 ft d/s Silver Creek Rd; length 105 ft	**Investigator:**	Janell Hillman

Survey Chronology:
Site Type: RS, General Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	TYPHACEAE	*Typha latifolia*	OBL	N
=20-50%	POACEAE	*Echinochloa crus-galli*	FACW	E
<20%	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Lactuca serriola*	FAC	E
	CHENOPODIACEAE	*Beta vulgaris*	FACU	E
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POACEAE	*Bromus catharticus*	NOL	E
	POACEAE	*Paspalum dilatatum*	FAC	E
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 42

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Norwood Creek	**Survey Date**: 10/13/99
Project/Activity: General Reference Site	**Investigator**: Janell Hillman
Location: 780 ft u/s of confluence with Lower Silver Creek; sample length 320 ft.	

If nontidal: Is water present in channel? yes

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used: Yellow book map

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	**b. Other native(s)**
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos disc 12

Vegetation description:

In general, vegetation along both levy slopes in this sample site was brown and dead. The channel itself was completely unvegetated. However, upon close inspection it was evident that this site did support a few individual patches of wetland vegetation (*Polygonum punctatum*) and a thin, narrow fringe along the right bank for part of the sample length which was composed mostly of *Cyperus eragrostis*. Both banks were overhung with weeds such as *Picris echiodies* and *Lolium* sp. Occasionally there was an individual *Epilobium* sp. Channel water was stagnant, with an algal bloom covering much of the sample site.

The un-sampled, downstream section of the site had occasional patches of *Ludwigia peploides*, which had yellow leaves and did not look that healthy. The water was slightly less stagnant here.

Comparison summary:

A small amount of fragmented wetland patches were present this year; in contrast to the site supporting no wetland at all last year. However, the water is still stagnant and filled with trash, much as it was in the previous year. The upland banks of the site are thick with the cover of dead weeds, making it difficult to even see the recolonization which is occurring at the edges of the banks.

Estimated wetland amount:

1ft x 4ft, 1ft x 10ft, 2ft x 213ft = 440 sq. ft., or 0.01 acre

SCVWD Wetlands Plant List

Facility Name:	Norwood Creek	**Survey Start Date:**	10/13/99
Location:	from 780 ft u/s Lower Silver Crk; length 320 ft	**Investigator:**	Janell Hillman

Survey Chronology:
Site Type: RS, General Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
<20%	ASTERACEAE	*Picris echioides*	FAC	E
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	ONAGRACEAE	*Epilobium sp.*	NOL	N
	POACEAE	*Lolium multiflorum*	NOL	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 43

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Smith Creek	**Survey Date**: 10/8/99
Project/Activity: General Reference Site	**Investigator**: Janell Hillman
Location: 200 ft d/s Elam Rd; sample length 120 ft.	

If nontidal: Is water present in channel? yes
Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**
Maps or photos used: Yellow book map

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	**c. Nonnative(s)**
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	51-75%	**26-50%**	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos disc 11

Vegetation description:

This site was very weedy with only a marginal wetland fringe along the banks. Native species relative cover was skewed towards the lower end of its respective category. *Paspalum dilatatum* was common on the left bank (20-50% relative cover), while *Cynodon dactylon* was common on the right bank (20-50% relative cover). The decision to include as wetland areas where *Cynodon* (a facultative species) was monospecific was made based on hydrology and soil moisture (soil was saturated at the time of survey and the facultative vegetation grew at the water's edge).

There was an occasional fringe of the aquatic plant *Lemna* sp. covering the open channel water. This sample site was similar to unsampled upstream and downstream sections.

Estimated wetland amount: 333 sq. ft., or 0.01 acre (0.01)
1ft wide x 21ft long, 4ft x 8 ft, 3ft x 6ft, 4ft x 7ft, 3ft x 30ft, 4ft x 7ft, 3ft x 28ft, 2ft x 16ft = 333 sq. ft.

SCVWD Wetlands Plant List

Facility Name:	Smith Creek	**Survey Start Date:**	10/8/99
Location:	200 ft d/s Elam Ave; length 120 ft	**Investigator:**	Janell Hillman

Survey Chronology:
Site Type: RS, General Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
=20-50%	POACEAE	*Cynodon dactylon*	FAC	E
	POACEAE	*Paspalum dilatatum*	FAC	E
<20%	ASTERACEAE	*Bidens frondosa*	FACW	N
	CHENOPODIACEAE	*Atriplex triangularis*	FACW	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N
	CYPERACEAE	*Cyperus esculentus*	FACW	N
	CYPERACEAE	*Cyperus involucratus*	OBL	E
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Avena sativa*	NOL	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 40

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: W. Little Llagas @ Sta. 100+00	**Survey Date**: 10/7/99
Project/Activity: General Reference Site	**Investigator**: G. Rankin
Location: From Cosmo St. to 100' u/s	

If nontidal: Is water present in channel? No, entire site dry.

Wetlands acreage estimates from: (a) map (b) photo (c) field measure

Maps or photos used:

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: No wetland present. Scattered, sparse vegetation on the cobbly channel bottom consisted mostly of *Xanthium strumarium*. On the rim of the low-flow channel were scattered individuals or small clusters of *Cyperus eragrostis*. The largest patches of *Cyperus* were 1'x5' and 1'x8'. *Rumex crispus* was also present. *Lolium muliflorum* grew in the upland area on the lower bank slopes along with *Cicorium intybus*, *Cynodon dactylon* and *Vitus* sp.

Estimated wetland amount: None

Notes:

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: W. Little Llagas @ Sta. 152+00	**Survey Date**: 10/7/99
Project/Activity: General Reference Site	**Investigator**: G. Rankin
Location: d/s Main St.	

If nontidal: Is water present in channel? No, study site dry. The only water in the channel was upstream of the study site, from Main St. bridge to approximately 50' d/s.

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used:

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description: The vegetation was dominated by dense stands of *Typha* sp. Throughout half of the site, vegetation extended in a solid stand from bank to bank. In the upstream half of the site, however, an unvegetated strip, approximately 2' wide meandered through the center of the *Typha* stand. Near the very downstream end, *Polygonum punctatum* was most prevalent, and occupied most of the channel, with *Typha* rimming the fringes. *Polygonum persicaria*, *Paspalum dilatatum*, and *Echinochloa crus galli*, were sparely distributed among the patch of *Polygonum punctatum*, and were also found along the wetland fringe throughout the site, along with *Epilobium ciliatum* and *Lactuca serriola*.

Estimated wetland amount: 12x80 = 960 sq. ft. (0.02 ac, the entire channel, bank to bank)

SCVWD Wetlands Plant List

Facility Name:	West Little Llagas Creek	**Survey Start Date:**	10/7/99
Location:	d/s Main St; length 80 ft	**Investigator:**	Gale Rankin

Survey Chronology:
Site Type: RS, General Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	TYPHACEAE	*Typha sp.*	OBL	N
<20%	ASTERACEAE	*Lactuca serriola*	FAC	E
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POACEAE	*Echinochloa crus-galli*	FACW	E
	POACEAE	*Paspalum dilatatum*	FAC	E
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	POLYGONACEAE	*Polygonum punctatum*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 47

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Guadalupe River	**Survey Date**: 9/20/99
Project/Activity: General Reference Site	**Investigator**: Janell Hillman
Location: From 1400 ft u/s of Tasman to 750 ft further u/s	Vegetation Type 1 of 2

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure

Maps or photos used: Guadalupe River, b/w Tasman and Hetch Hetchy, sheet 1 of 1, image # C59188

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	5% or less	**6-25%**	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos Disc 9 and 10

Vegetation description:

Site conditions consisted of two very wide (75 ft each or greater in some areas), low benches with a channel of open water between them. Wetland of moderate vegetative cover grew on the benches and was interspersed with thick and matted, dead vegetative biomass.

Two main wetland vegetation types were present. Vegetation type 1 comprised the majority of the wetland on site and was located on wide, low benches on either side of the channel. It was dominated by low-growing herbaceous vegetation such as *Polygonum punctatum* (>50% relative cover), *Atriplex triangularis* (20-50% relative cover), and the invasive *Lepidium latifolium* (skewed towards the low end of the 6-25% relative cover category). This vegetation grew in sporadic clumps out of a thick mat of dead *Typha* (in some places one foot deep, and just starting to decompose) from the previous year, which almost completely covered the site. There were also scattered new sprouts of *Sparganium eurycarpum* and possibly *Typha* sp. coming up out of the thick, dead, matted stems.

Conditions were similar downstream of the reference site. Upstream of the sample site and the Hetch Hetchy pipeline located on the right bank, vegetation became thick and woody, with mature to semi-mature trees in places, and the channel narrowed slightly.

Comparison summary:

The vegetation characteristics of the study site this year are in stark contrast to those of last year. Spraying of *Typha* by maintenance crews last year may be responsible for the almost total die-off of *Typha* spp., which has changed the site from its previously thick cover and almost monospecific dominance. The thick and matted dead vegetation, which is decomposing very slowly, makes new recruitment difficult. The herbaceous, low-growing plants such as *Polygonum* seem to be the new colonizers.

Estimated wetland amount: 111949 sq. ft., or 2.57 acres

SCVWD Wetlands Plant List

Facility Name:	Guadalupe River	**Survey Start Date:**	9/20/99
Location:	1400 ft to 750 ft u/s Tasman Dr	**Investigator:**	Janell Hillman

Survey Chronology:
Site Type: RS, General Reference Site
Vegetation Type: Type 1 of 2

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	POLYGONACEAE	*Polygonum punctatum*	OBL	N
=20-50%	CHENOPODIACEAE	*Atriplex triangularis*	FACW	N
<20%	ASTERACEAE	*Picris echioides*	FAC	E
	ASTERACEAE	*Bidens frondosa*	FACW	N
	ASTERACEAE	*Sonchus oleraceus*	NI	E
	ASTERACEAE	*Lactuca serriola*	FAC	E
	ASTERACEAE	*Xanthium strumarium*	FAC+	E
	BRASSICACEAE	*Lepidium latifolium*	FACW	I
	CYPERACEAE	*Scirpus californicus*	OBL	N
	CYPERACEAE	*Scirpus maritimus*	OBL	N
	CYPERACEAE	*Scirpus robustus*	OBL	N
	ONAGRACEAE	*Epilobium ciliatum ssp. cilatum*	FACW	N
	POLYGONACEAE	*Polygonum amphibium var. emersum*	OBL	N
	POLYGONACEAE	*Rumex crispus*	FACW-	E
	POLYGONACEAE	*Polygonum lapathifolium*	OBL	N
	POLYGONACEAE	*Polygonum persicaria*	FACW	E
	SOLANACEAE	*Solanum sp.*	NOL	E
	TYPHACEAE	*Sparganium eurycarpum ssp. eurycarpum*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 35

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Guadalupe River	**Survey Date**: 9/20/99
Project/Activity: General Reference Site	**Investigator**: Janell Hillman
Location: From 1400 ft u/s of Tasman to 750 ft further u/s	Vegetation Type 2 of 2

If nontidal: Is water present in channel?
Wetlands acreage estimates from: (a) map **(b) photo** (c) field measure
Maps or photos used: Guadalupe River, b/w Tasman and Hetch Hetchy, sheet 1 of 1, image # C59188

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or **mix**
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list):

Vegetation description:

Site conditions consisted of two very wide (75 ft each or greater in some areas), low benches with a channel of open water between them. The sample site was composed of two main wetland vegetation types. In Type I, wetland of moderate vegetative cover grew on the benches and was interspersed with thick and matted, dead vegetative biomass. Vegetation type 2 grew as a fringe along the right bench of the site next to the open channel, and comprised about 10% of the total wetland vegetation on site. It was co-dominated by *Scirpus californicus* and *Typha latifolia* (each with 20-50% relative cover). The *Scirpus* grew along the water's edge and the *Typha* was clustered next to the *Scirpus*. *Sparganium eurycarpum* was also common but was present at cover values of much less than 20%.

Estimated wetland amount: 12458 sq. ft., or 0.29 acre

SCVWD Wetlands Plant List

Facility Name:	Guadalupe River	**Survey Start Date:**	9/20/99
Location:	1400 ft to 750 ft u/s Tasman Dr	**Investigator:**	Janell Hillman

Survey Chronology:
Site Type: RS, General Reference Site
Vegetation Type: Type 2 of 2

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
=20-50%	CYPERACEAE	*Scirpus californicus*	OBL	N
	TYPHACEAE	*Typha latifolia*	OBL	N
<20%	TYPHACEAE	*Sparganium eurycarpum ssp. eurycarpum*	OBL	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 35

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: San Francisquito Creek	**Survey Date**: 11/4/99
Project/Activity: General Reference Site	**Investigator**: Louisa Squires
Location: Station 73+00 - 74+00[1]	

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used: None

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. **Other native**	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species List; Louisa's photos

Vegetation description:

The wetland (total cover 95%) occurred as a continuous low wetland bench on the west bank and fringing patches of wetland on the east bank. The wetland on the west bank was dominated by *Spartina foliosa* (50%) with a subdominant understory of *Distichlis spicata* (25%) and *Salicornia virginica* (15%). At the upstream end of the site, *Grindelia stricta* replaced *D. spicata* as the major subdominant for a short stretch. The wetland patches on the east bank were dominated by *Atriplex triangularis*. Additional species present included *Polypogon monspeliensis, Cynodon dactylon* and at the downstream end, a patch of *Typha angustifolia*.

Estimated wetland amount:
9 ft. wetland x 45 length = 405 ft. sq.
3 ft. wetland x 20 length = 60 ft. sq.
10 ft. wetland x 40 length = 400 ft. sq.
15 ft. wetland x 1 length = 15 ft. sq.
5 ft. wetland x 10 length = 50 ft. sq.
Total: **930 sq. ft.; 0.02 acre**

Notes:

[1] u/s end is 56' d/s of vehicle barriers located on the east levee.

In comparison to results of the 1998 surveys, two differences are apparent: 1) the extent and dominance of *Spartina foliosa* has increased, while within the same location, the abundance of *Salicornia virginica* has decreased; 3) *Grindelia stricta,* which occurred as a single individual in 1998, colonized a small stream-side area on the upstream portion of the site on the west bank in 1999.

Instream Wetlands Plant Checklist - SCVWD Maintenance Program

Stream/Location/Project: San Francisquito Creek 2 73+00 General Reference Site Date: 11/4/99

FAMILY NAME	**SPECIES** **(Bold = Native P= Pest or invasive)**	**INDICATOR STATUS**	REL. COV. (%)		
			<20	20-50	> 50
ASTERACEAE	*Cotula coronopifolia*	FACW+	X		
ASTERACEAE	***Grindelia stricta***	**NOL**	X		
CHENOPODIACEAE	***Atriplex triangularis***	**FACW**	**X**		
CHENOPODIACEAE	***Salicornia virginica***	**OBL**	**X**		
POACEAE	*Cynodon dactylon*	FAC	X		
POACEAE	***Distichlis spicata***	**FACW**	**X**		
POACEAE	*Polypogon monspeliensis*	FACW+	X		
POACEAE	***Spartina foliosa***	**OBL**		**X**	
TYPHACEAE	***Typha angustifolia***	**OBL**	**X**		

Additional Comments: NI = listed but no wetland status indicated

NOL = not on list

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Stevens Creek	**Survey Date**: 11/3/99
Project/Activity: General Reference Site	**Investigator**: Louisa Squires
Location: Station 90+00 - 92+20	

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used: None

Dominance (>50% Relative Cover)	
Tidal	**Nontidal**
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. **Other native**	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	**Categories**				
	A	**B**	**C**	**D**	**E**
Total percent cover	**76-100%**	51-75%	26-50%	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; Louisa's photos

Vegetation description:

The wetland is restricted to the east channel; there is no substrate for wetland establishment in the west channel due to a vertical cutbank. The east channel wetland is restricted to a fringing mixed community dominated by *Salicornia virginica* (20% relative cover). Other species included *Cynodon dactylon* (15% relative cover), and *Scirpus robustus* (10% relative cover) and a variety of less abundant species (*Cyperus eragrosits*, *Polypogon monspeliensis*, *Agrostis viridis*, *Scirpus californicus* and others) collectively comprising approximately 50% relative cover. Although prevalent in the upland portions of the site, *Lepidium latifolium* had relative cover of <5% in the wetland. There was no rooted aquatic vegetation at the site.

Estimated wetland amount:

1 ft. wetland width x 35 length = 35 sq. ft.
4 ft. wetland width x 10 ft length = 40 sq. ft.
Total: 0.002 acre, or 75 sq. ft.

Notes:

u/s end is 77' u/s of vehicle barrier located on west levee at Crittenden Bridge

In comparison to the results of the 1998 surveys, several differences are apparent: 1) a substantial decrease in wetland area (though wetland was not abundant at this site in 1998); 2) whereas the wetland community was dominated by several *Polygonu*m species in 1998, only two individuals of *Polygoum* (*P. persicaria*) were present in 1999; 3) the native species relative percent cover decreased in 1999, in part due to the absence of the native *P. lapathifolium*, which was the dominant species in 1998. It is also of interest to note the presence of standing litter of *S. robustus* (1998 growth) present in the low marsh zone where there was no 1999 growth.

Instream Wetlands Plant Checklist - SCVWD Maintenance Program

Stream/Location/Project: Stevens Creek @99+00, General Reference Site Date: 11/3/99

FAMILY NAME		**SPECIES** **(Bold = Native P= Pest or invasive)**	**INDICATOR STATUS**	REL. COV. (%) <20	 20-50	 > 50
BRASSICACEAE	P	Lepidium latifolium	**FACW**	X		
CHENOPODIACEAE		***Atriplex triangularis***	**FACW**	**X**		
CHENOPODIACEAE		***Salicornia virginica***	**OBL**		**X**	
CYPERACEAE		***Cyperus eragrostis***	**FACW**	**X**		
CYPERACEAE		***Scirpus californicus***	**OBL**	**X**		
CYPERACEAE		***Scirpus robustus***	**OBL**	**X**		
ONAGRACEAE		***Epilobium ciliatum ssp. ciliatum***	**FACW**	**X**		
POACEAE		*Agrostis viridis*	OBL	X		
POACEAE		*Cynodon dactylon*	FAC	X		
POACEAE		*Echinochloa crus-galli*	FACW	X		
POACEAE		*Polypogon monspeliensis*	FACW+	X		
POLYGONACEAE		*Polygonum persicaria*	FACW	X		

Additional Comments: NI = listed but no wetland status indicated

NOL = not on list

SCVWD WETLAND ASSESSMENT CHECKLIST: 1999 SURVEYS

Stream/River: Sunnyvale West	**Survey Date**: 10/8/99
Project/Activity: General Reference Site	**Investigator**: Janell Hillman
Location: 250 ft u/s Caribbean Dr; length 440 ft.	

If nontidal: Is water present in channel?

Wetlands acreage estimates from: (a) map (b) photo **(c) field measure**

Maps or photos used: Yellow book map

Dominance (>50% Relative Cover)	
Tidal	Nontidal
a. Alkali bulrush	a. Bulrush, cattail, burreed or mix
b. California bulrush	b. Other native(s)
c. Cattail	c. Nonnative(s)
d. Cattail/bulrush mix	d. Other (describe)
e. Other native	
f. Nonnative	
g. Other (describe)	

Highlight one category for each indicator below:

Vegetation Quality Indicators	Categories				
	A	B	C	D	E
Total percent cover	76-100%	51-75%	**26-50%**	11-25%	10% or less
Native species relative percent cover	76-100%	**51-75%**	26-50%	11-25%	10% or less
Invasive species relative percent cover	**5% or less**	6-25%	26-50%	51-75%	76-100%

Attachments or associated materials (list): Species list; digital photos disc # 11

Vegetation description:

The wetland in this sample site consisted of two fringing strips of vegetation along the channel banks at the water's edge, as well as small, scattered in-stream or bank-edge patches of *Scirpus californicus*.

Vegetation was dominated by *Polygonum punctatum* (>50% relative cover), with *Rumex crispus* occurring as a sub-dominant (20-50% relative cover). The *Polygonum* was more common on the right bank; while the *Rumex* was more common on the left bank. In general, vegetative cover was fairly low (26-50% total cover). As seen in the previous year's assessment, the wetland vegetation on both banks has been mowed recently. Diversity of vegetation was also quite low, with only a handful of species noted in the wetland.

Comparison Summary:

Vegetative cover of the wetland was much lower this year than in the previous year. This could potentially be correlated to the evidence of recent mowing of the site, which has occurred for the second consecutive year these surveys have been conducted during the growing season.

Estimated wetland amount: 3598 sq. ft.; 0.08 acre
Right bank: 6 ft wide x 440 ft long: 2640 sq. ft.
Left bank: 4 ft wide x 440 ft long @ 50% wetland: 880 sq. ft.
In stream patches of Scirpus californicus: 5 ft x 4 ft, 5 ft x 5 ft, 5 ft x 1 ft, 1 ft x 1 ft, 1 ft x 1 ft, 1 ft x 1 ft, 3 ft x 2 ft, 1 ft x 2 ft, 1 ft x 2 ft, 1 ft x 1 ft, 6 ft x 2 ft, 1 ft x 2 ft

SCVWD Wetlands Plant List

Facility Name:	Sunnyvale West Channel	**Survey Start Date:**	10/8/99
Location:	250 ft u/s Caribbean Dr; length 440 ft	**Investigator:**	Janell Hillman

Survey Chronology:
Site Type: RS, General Reference Site

Relative Cover	Family	Species	Wetland Indicator Status	Origin[1]
>50%	POLYGONACEAE	*Polygonum punctatum*	OBL	N
=20-50%	POLYGONACEAE	*Rumex crispus*	FACW-	E
<20%	CYPERACEAE	*Scirpus californicus*	OBL	N
	CYPERACEAE	*Cyperus eragrostis*	FACW	N

[1] N = Native, E = Exotic, I = Invasive Exotic

Code: 39

APPENDIX E
1997 Excavation and Adjacent Reference Site Photographs

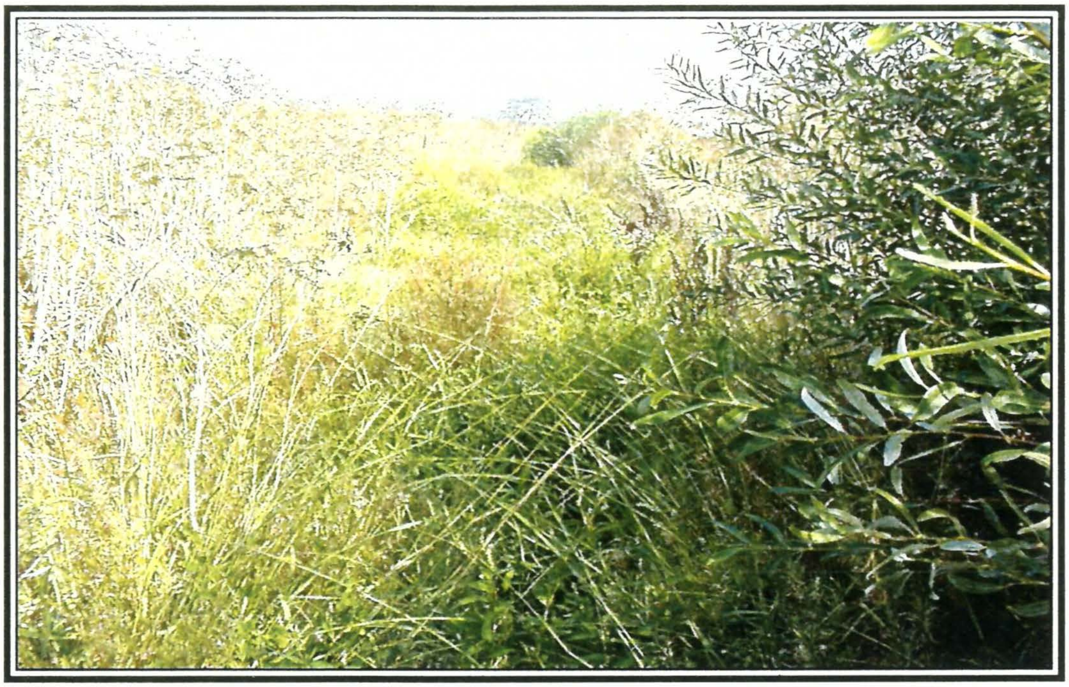


Figure 1. Jones Creek 1997 Excavation Study Site. View u/s from the d/s end of site near concrete weir. A large willow sapling has grown up on and completely blocks the original photo point. Present photo was taken just to the left of this sapling (still visible on right). September 1999.

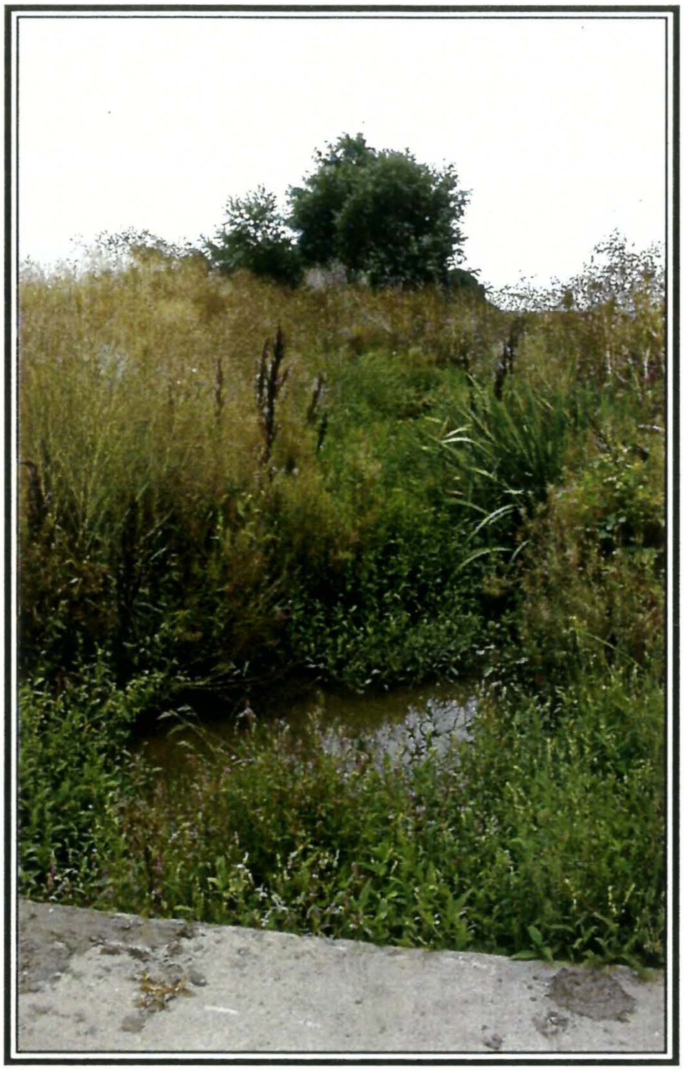
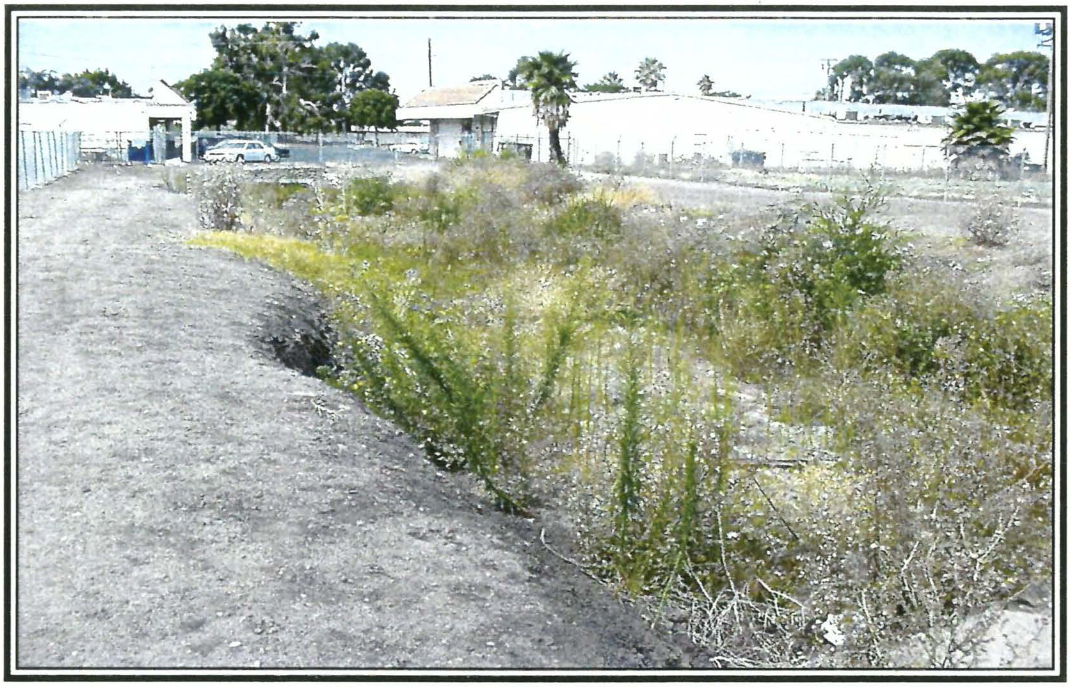
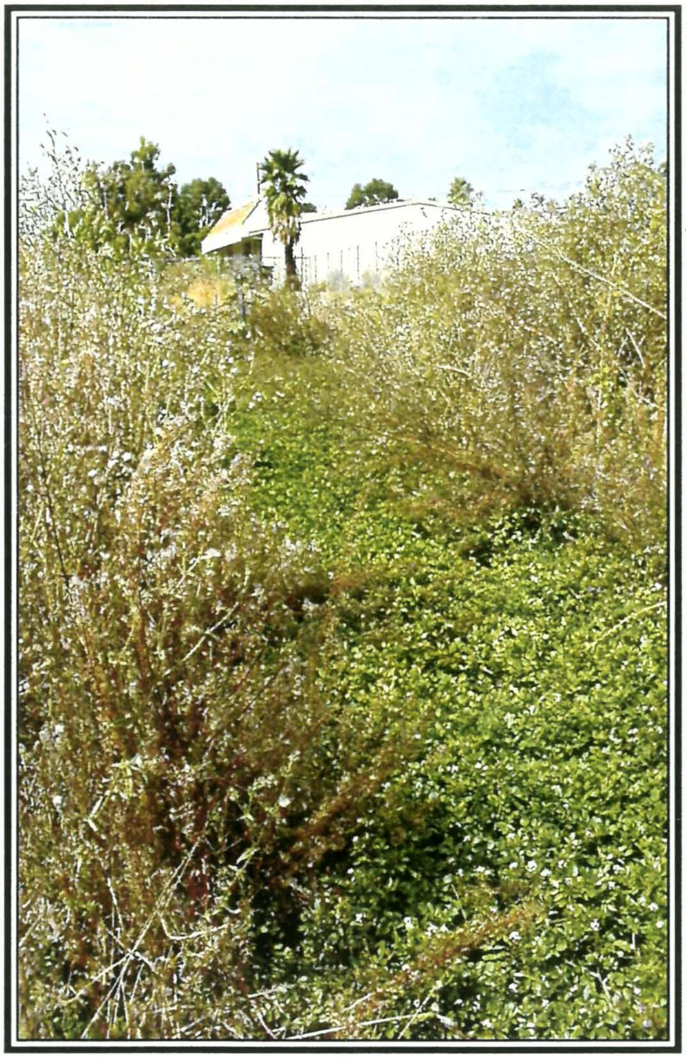


Figure 2. Jones Creek Adjacent Reference Site.
View d/s from the u/s end of site near concrete weir.
September 1999.



3a. View looking d/s. The weedy, cobbled bar above the low flow channel is visible in the photo.

Figure 3. Los Coches Creek 1997 Excavation Study Site. September 1999.



3b. Native vegetation type in low flow channel.

Figure 3. Continued.

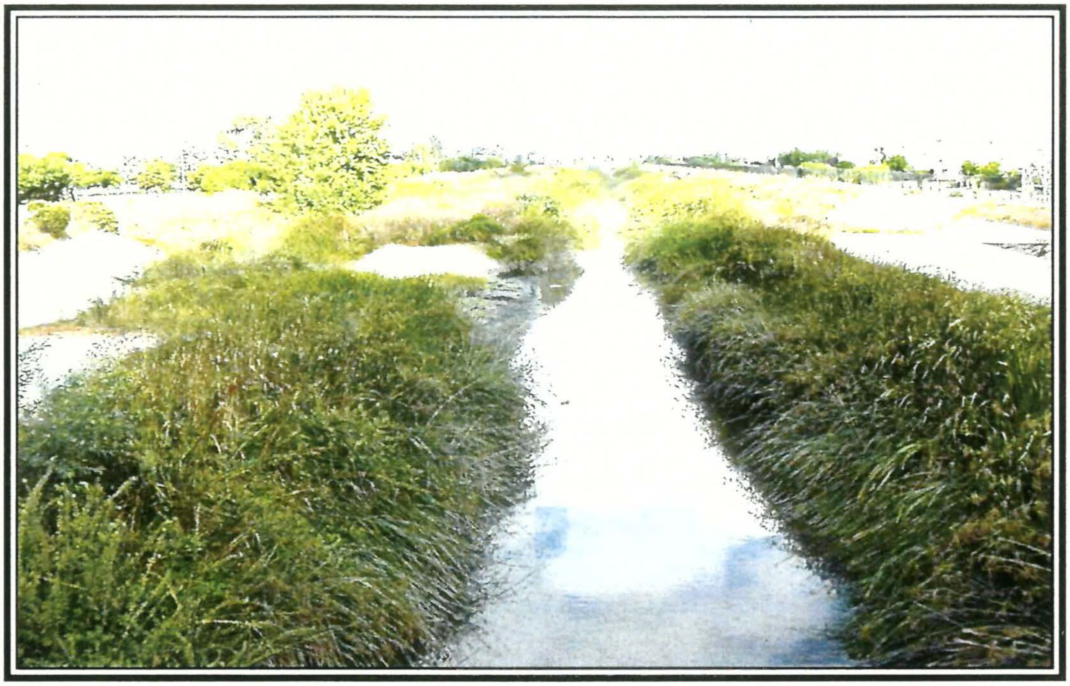
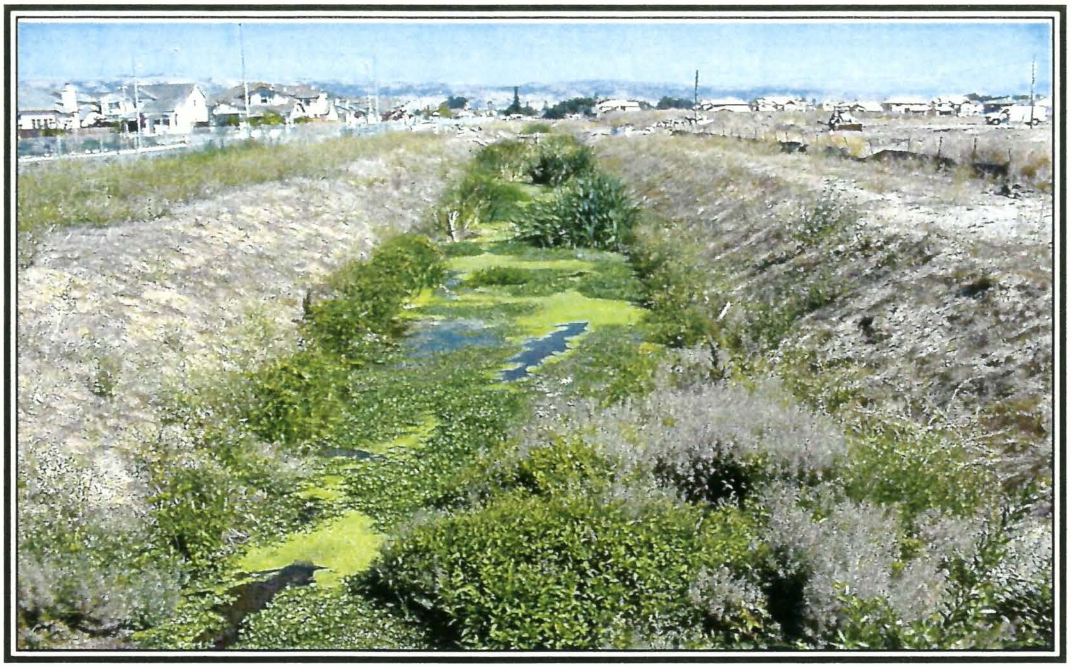
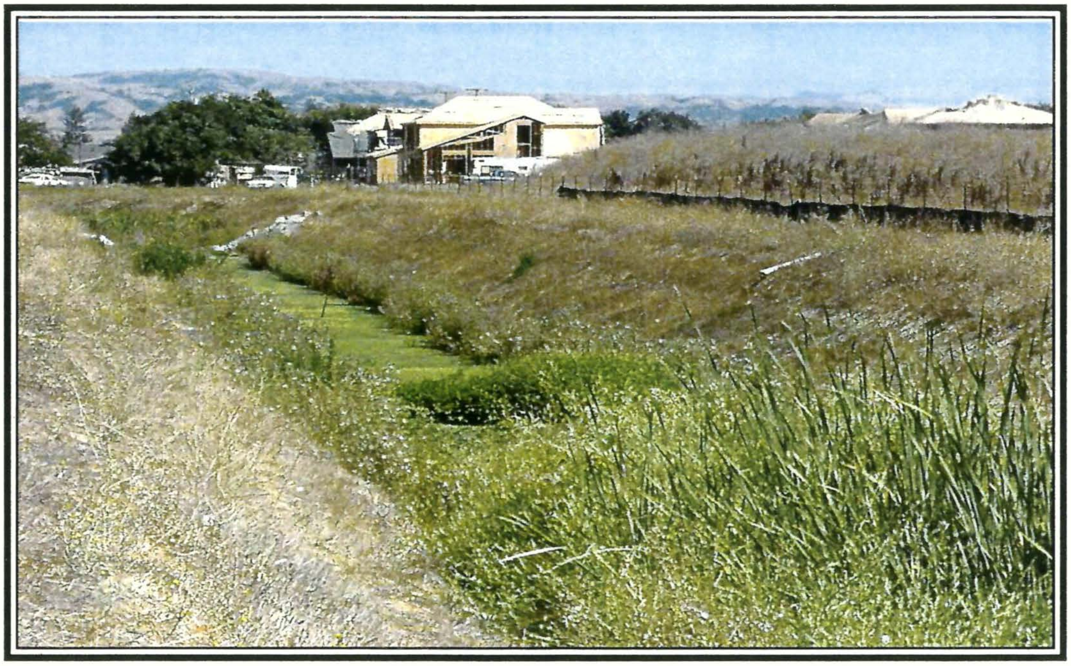


Figure 4. Lower Penitencia Creek 1997 Excavation (left channel) and Adjacent Reference Sites (right channel). View from Milmont Dr. d/s. The dense tidal wetlands are dominated by California bulrush. October 1999.

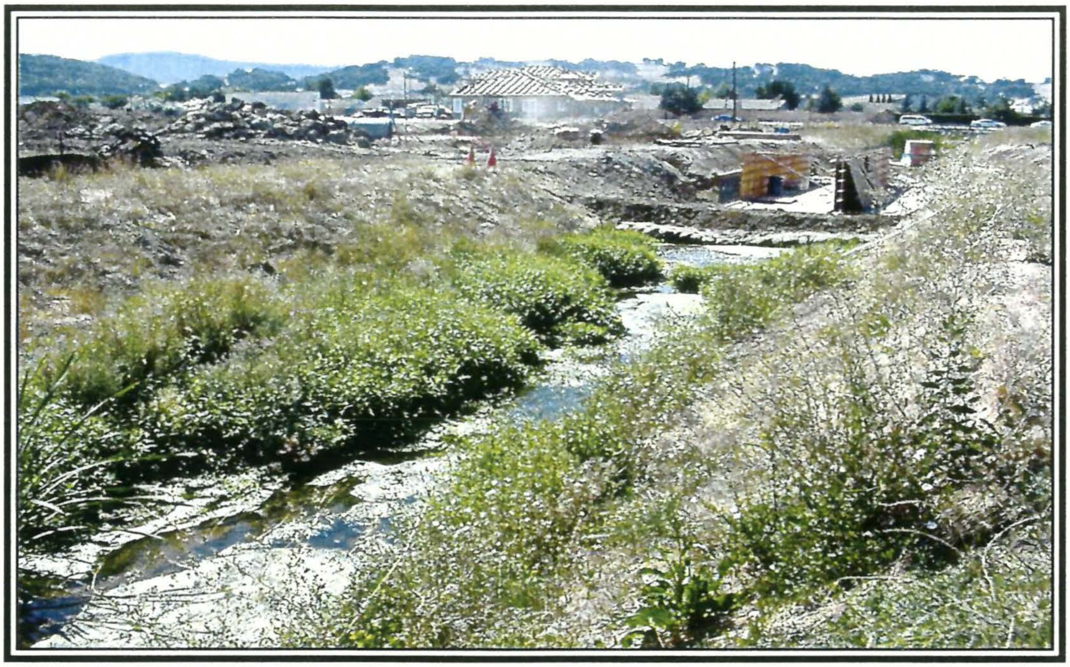


5a. View downstream from Santa Theresa Blvd.



5b. View downstream from mid-site. Note the abrupt end of bank to bank wetland vegetation and the subsequent cover by the floating aquatic plant *Lemna* sp.

Figure 5. North Morey Channel 1997 Excavation Site. September 1999.



5c. Looking u/s towards the bridge construction area on North Morey Channel in the Excavation Study Site. All vegetation was completely removed for a length of 200 ft.

Figure 5. Continued.

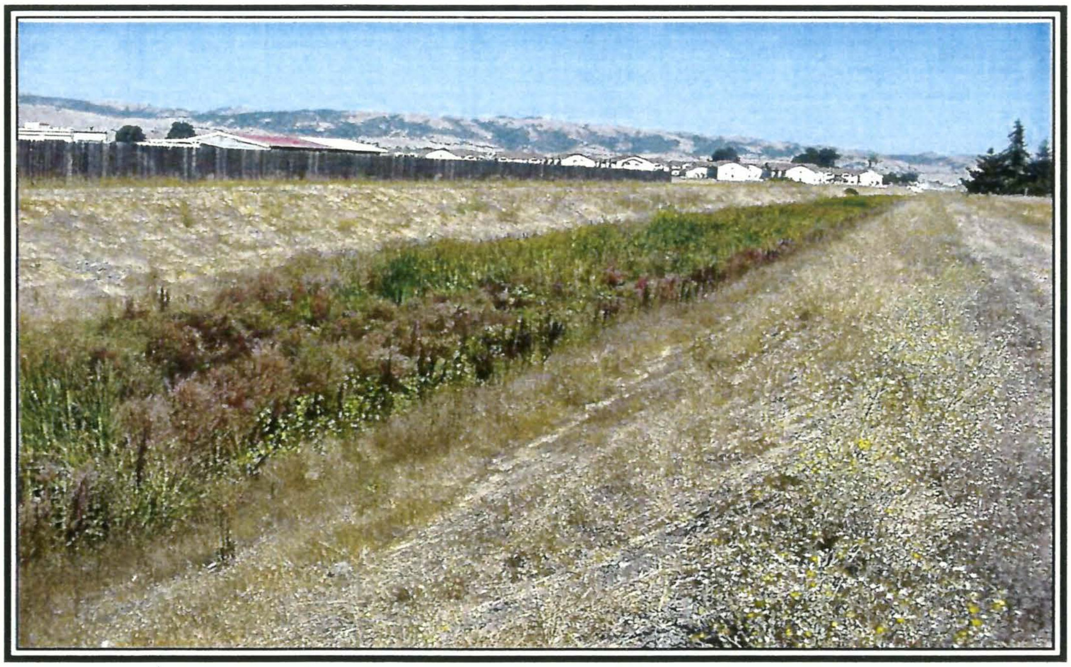
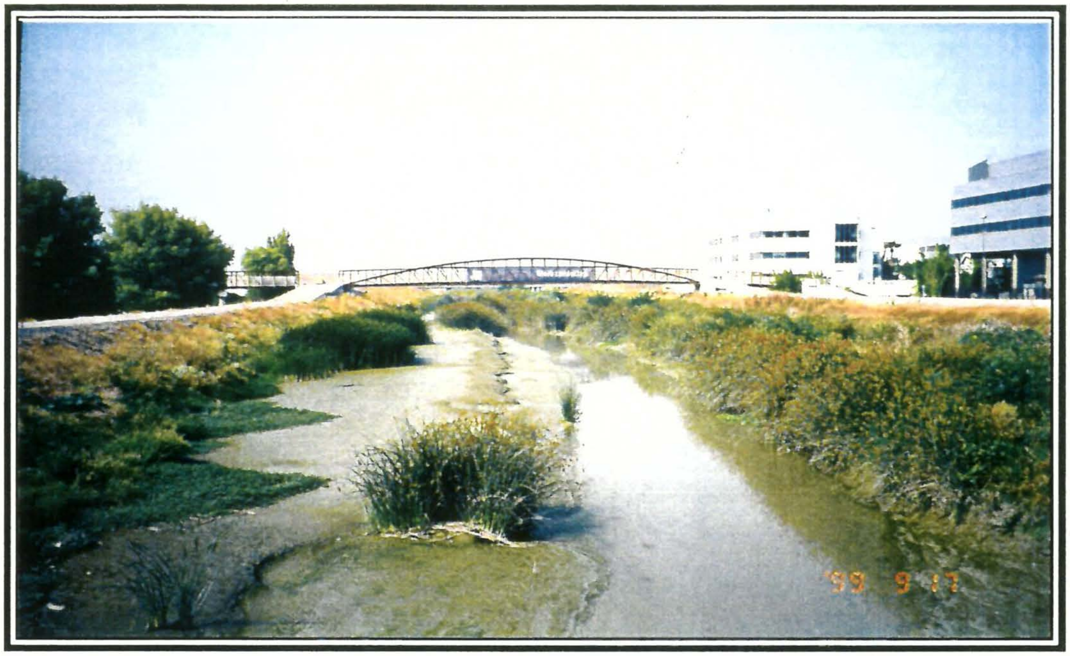
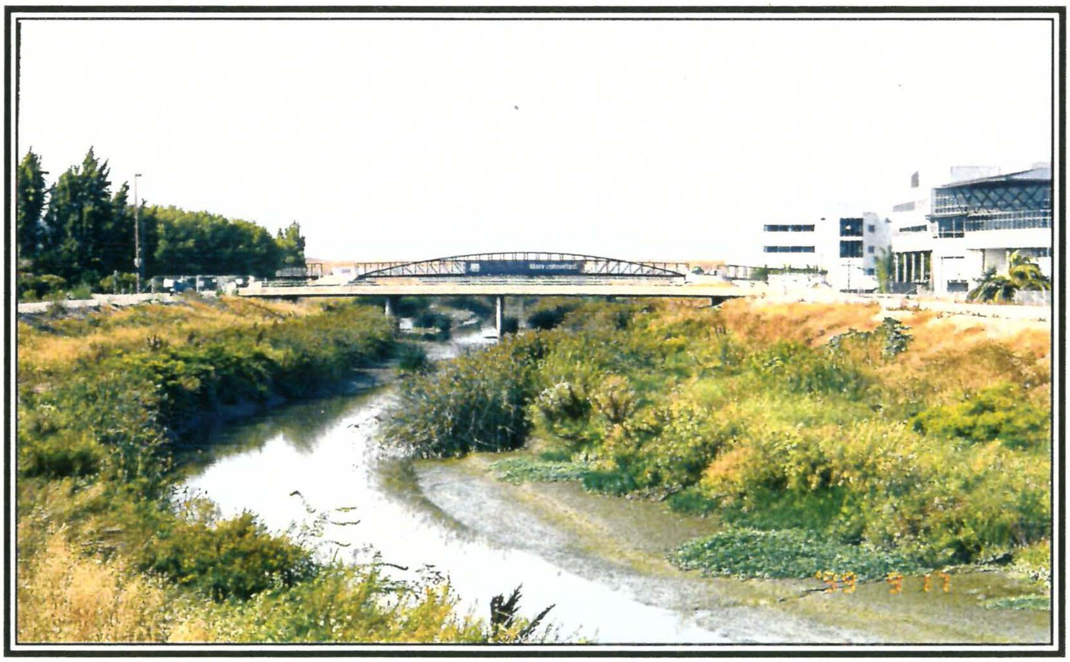


Figure 6. North Morey Adjacent Reference Site (Lions Creek). View d/s. Site is dominated by cattails, with some mixed nut sedge and water primrose. September 1999.



7a. Second year postproject view d/s from Old Mountain View-Alviso Rd. towards Hwy. 237.



7b. Second year postproject view d/s Great America toward Old Mountain View-Alviso Rd. There is more California bulrush than last year. Footbridge is new construction.

Figure 7. San Tomas Creek (tidal) u/s Hwy. 237: 1997 Excavation Site. September 1999.

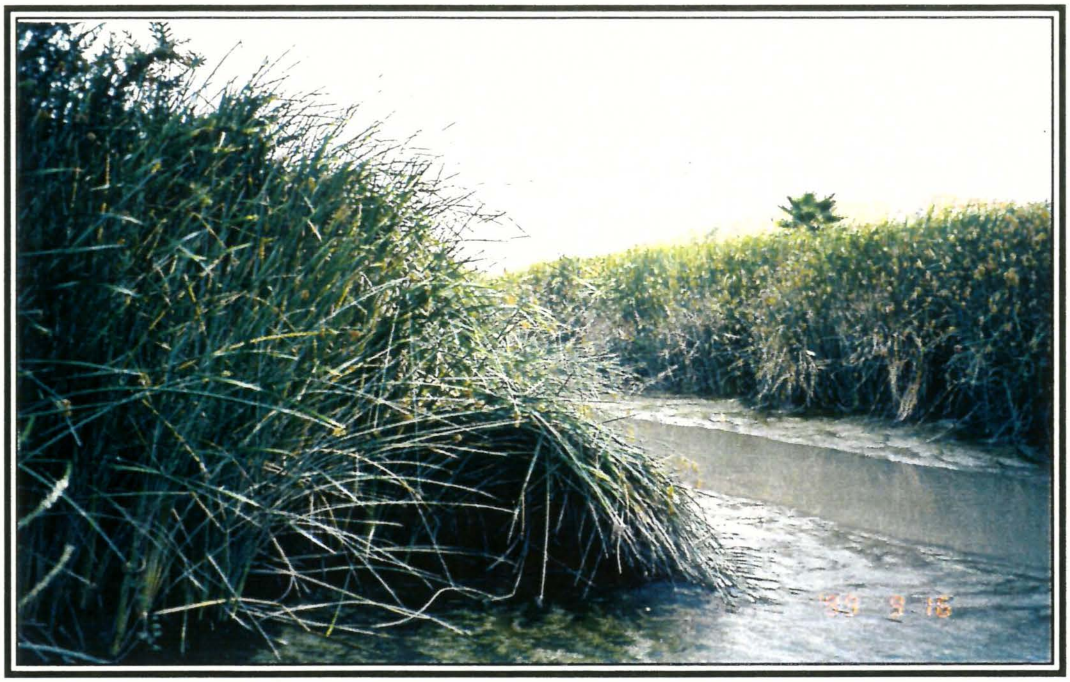


Figure 8. San Tomas (tidal) d/s Hwy. 237 Adjacent Reference Site. View d/s from near Hwy. 237. California bulrushes dominate wide benches rimming the open channel. September 1999.

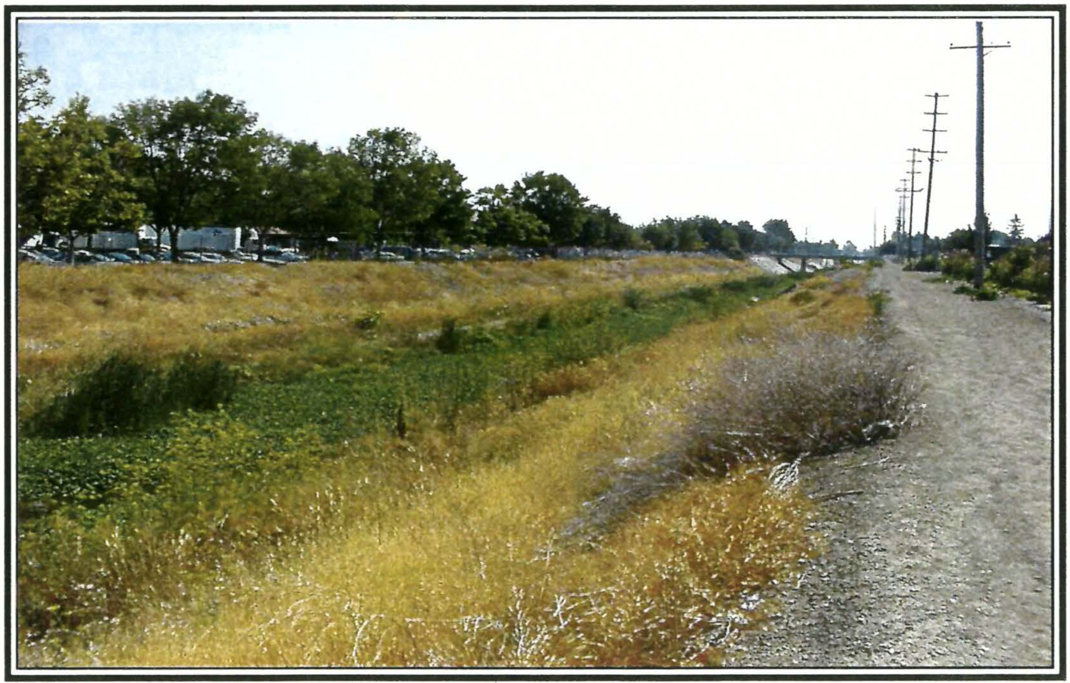
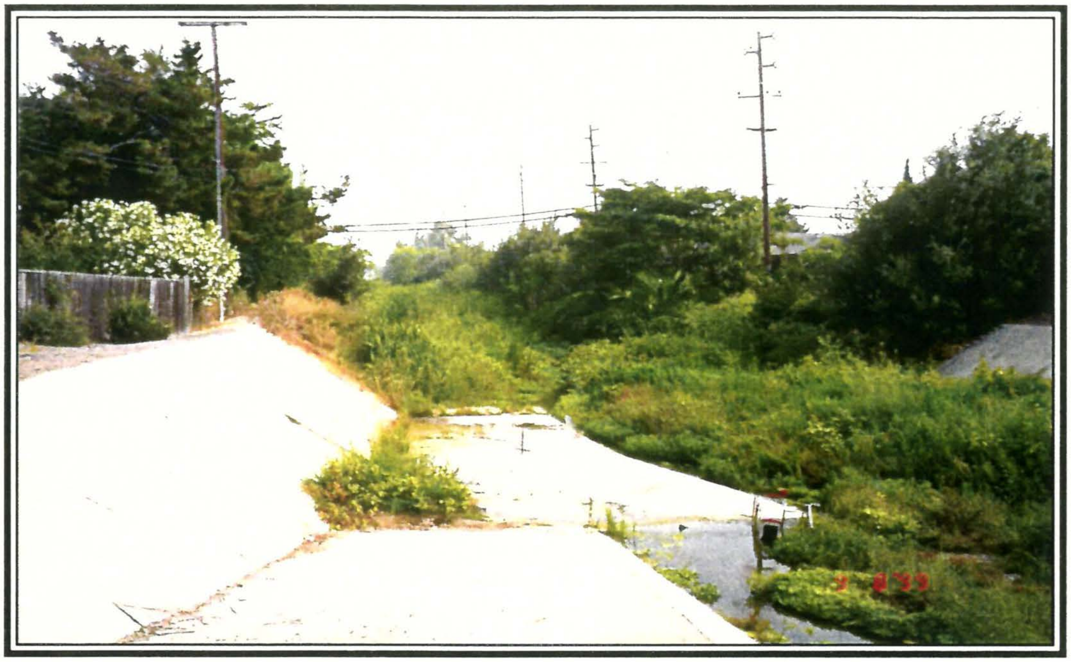
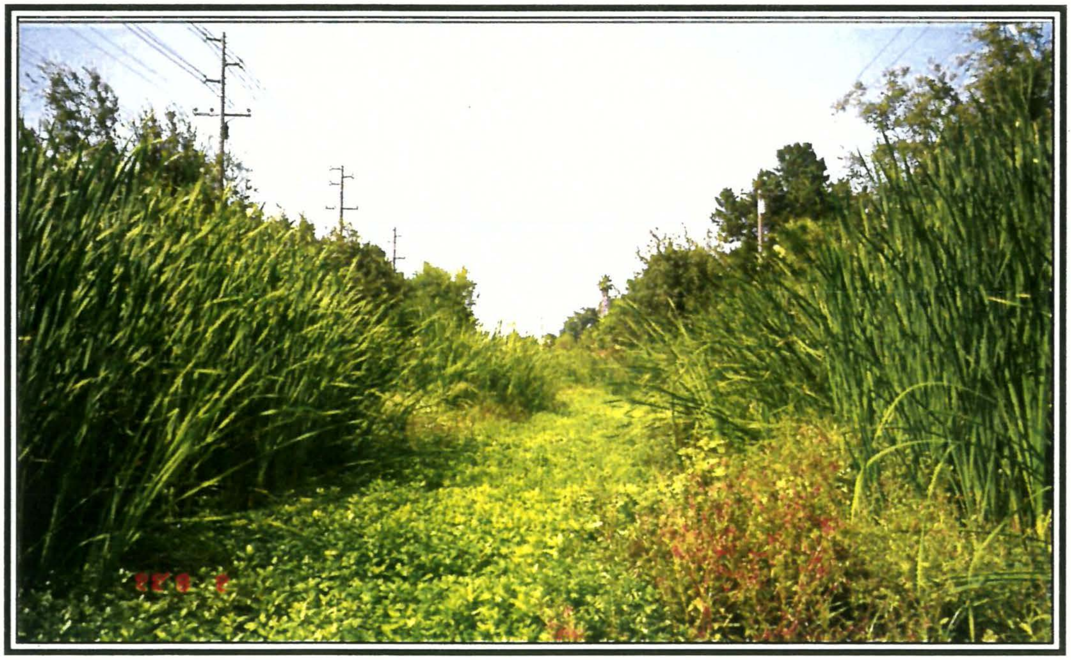


Figure 9. San Tomas Creek (nontidal) u/s of Central Expressway 1997 Excavation Study Site. View looking upstream. September 1999.



10a. View d/s from Cabrillo Ave. Wetlands occupy the entire channel bed, including the area of the depressed maintenance road, as in 1997 and 1998.



10b. Close-up view of wetlands looking d/s. More cattails are present than in 1997 or 1998.

Figure 10. Saratoga Creek 1997 Excavation Study Site: second year post-project. September 1999.

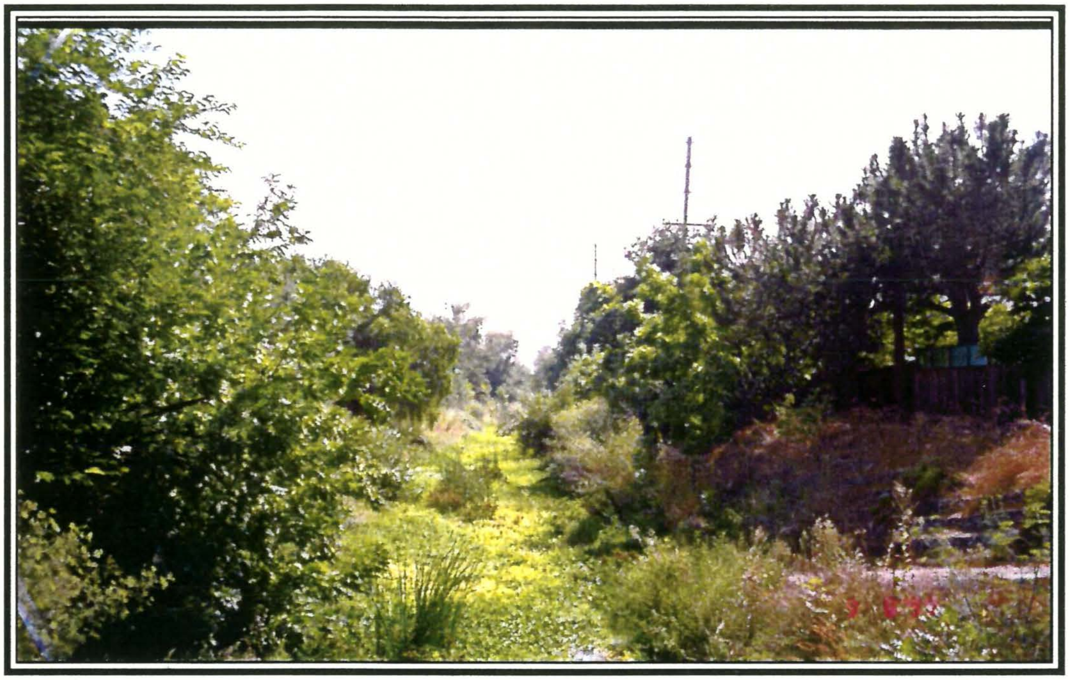


Figure 11. Saratoga Creek Adjacent Reference Site. View u/s from Warburton Ave. Wetlands have expanded since 1998 and now extend bank to bank. September 1998.

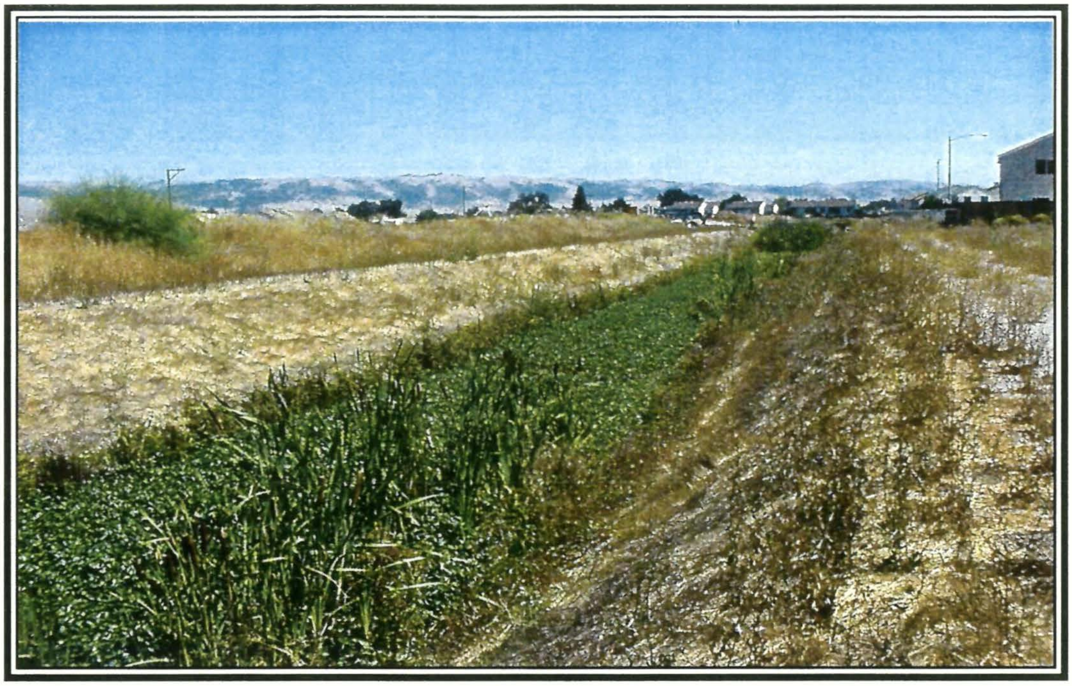


Figure 12a. View d/s from mid-site over fully-excavated portion of the channel.

Figure 12. South Morey Channel 1997 Excavation Site. September 1999.

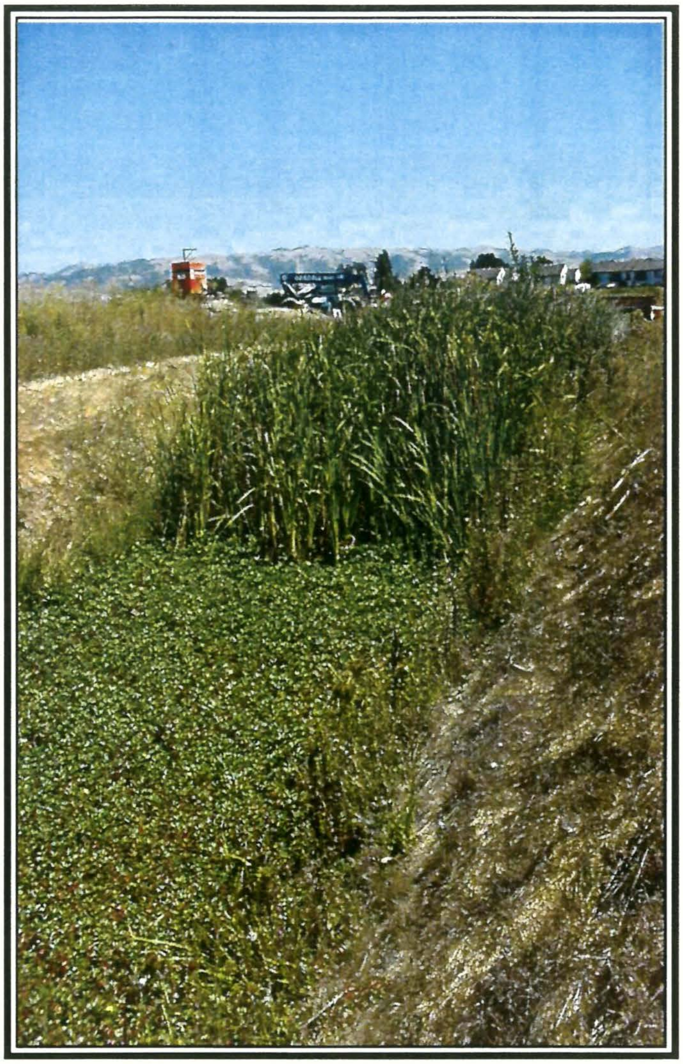
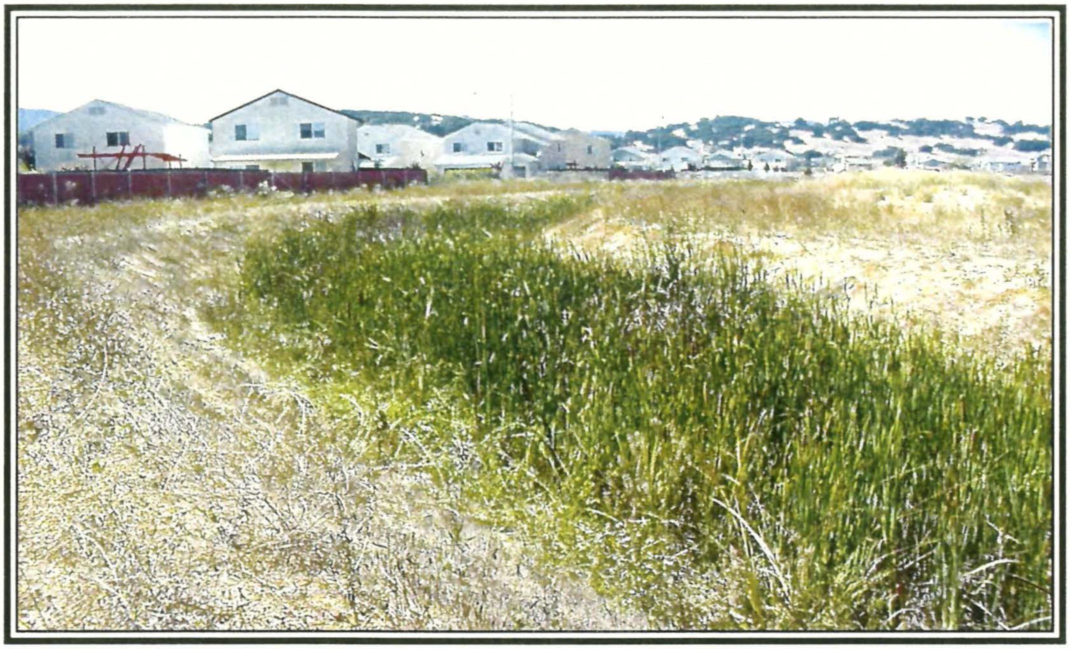
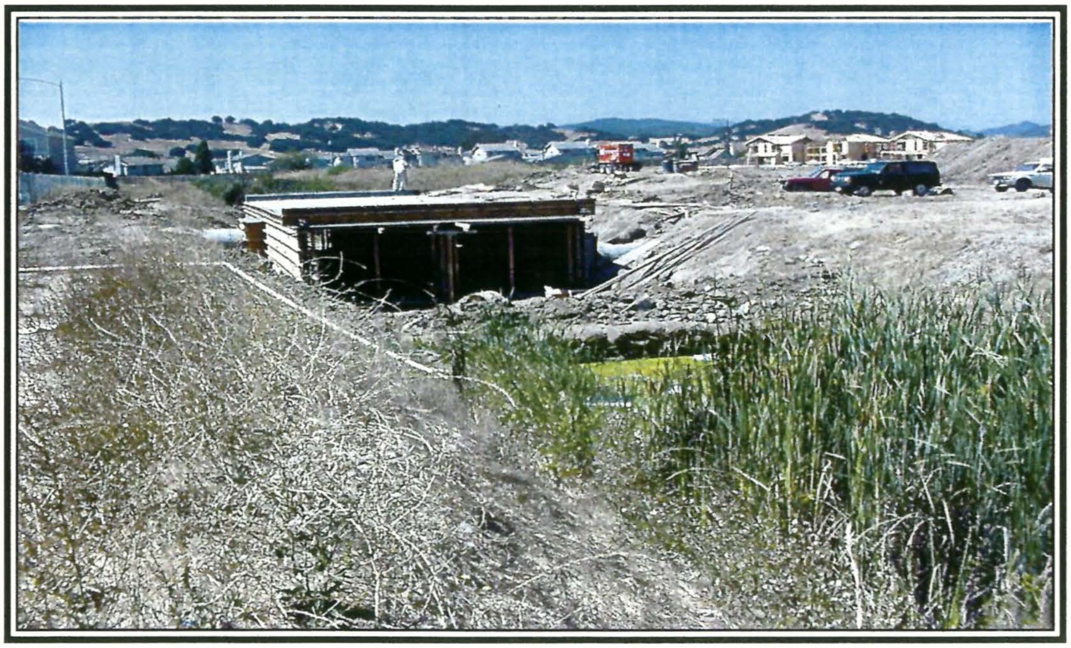


Figure 12b. View d/s from below mid-site. Water primrose-dominated vegetation in the fully-excavated u/s portion gives way to cattails in the d/s portion, which previously was only half-excavated.

Figure 12. Continued.



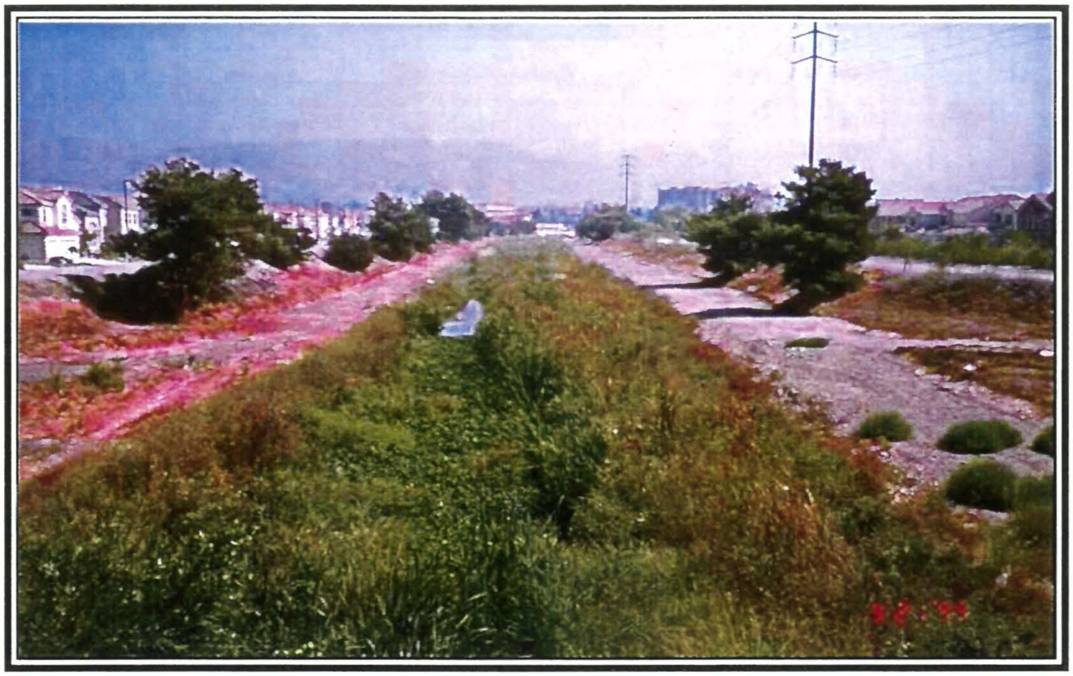
13a. South Morey Channel Adjacent Reference Site. View from d/s end of reference site looking u/s. Cattails are predominant.



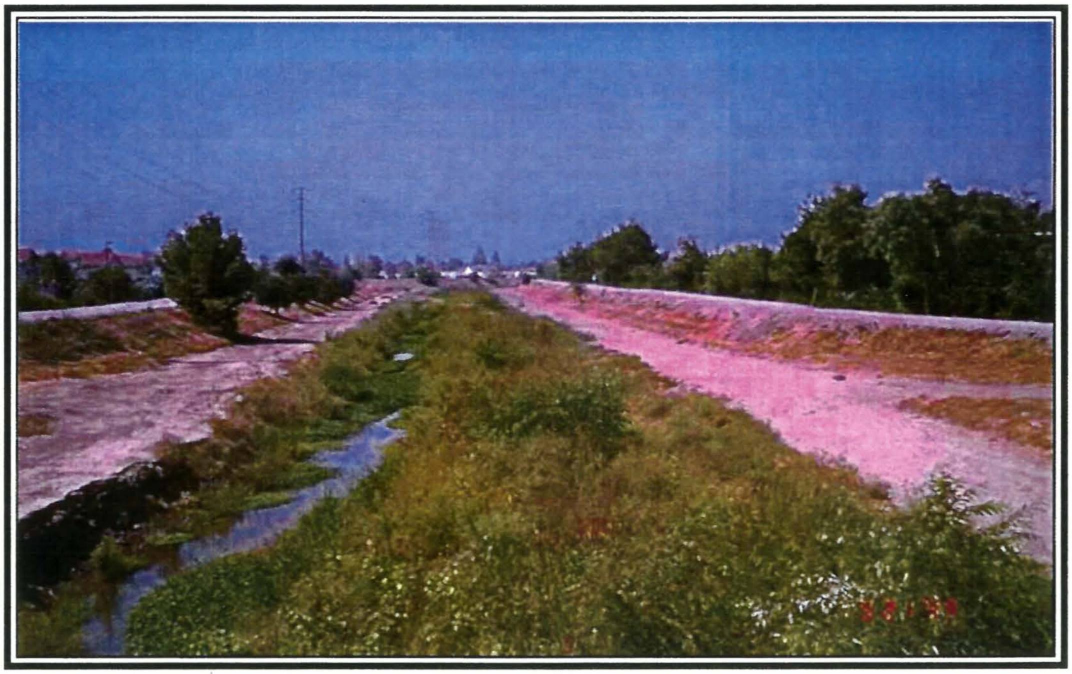
13b. South Morey Channel bridge impact area. View looking u/s. The bridge impacts both the Excavation Study Site and the Adjacent Reference Site.

Figure 13. South Morey Channel Adjacent Reference Site and bridge impact area. September 1999.

APPENDIX F
1998 Excavation and Adjacent Reference Site Photographs



1a. View u/s Milpitas Blvd.



1b. View d/s Milpitas Blvd.

Figure 1. Berryessa Creek u/s of Lower Penitencia Creek: 1998 Excavation Sites. Post-second project. Other native dominated wetlands are visible in the low-flow channel with non-native wetlands on the adjacent benches. September 1999.

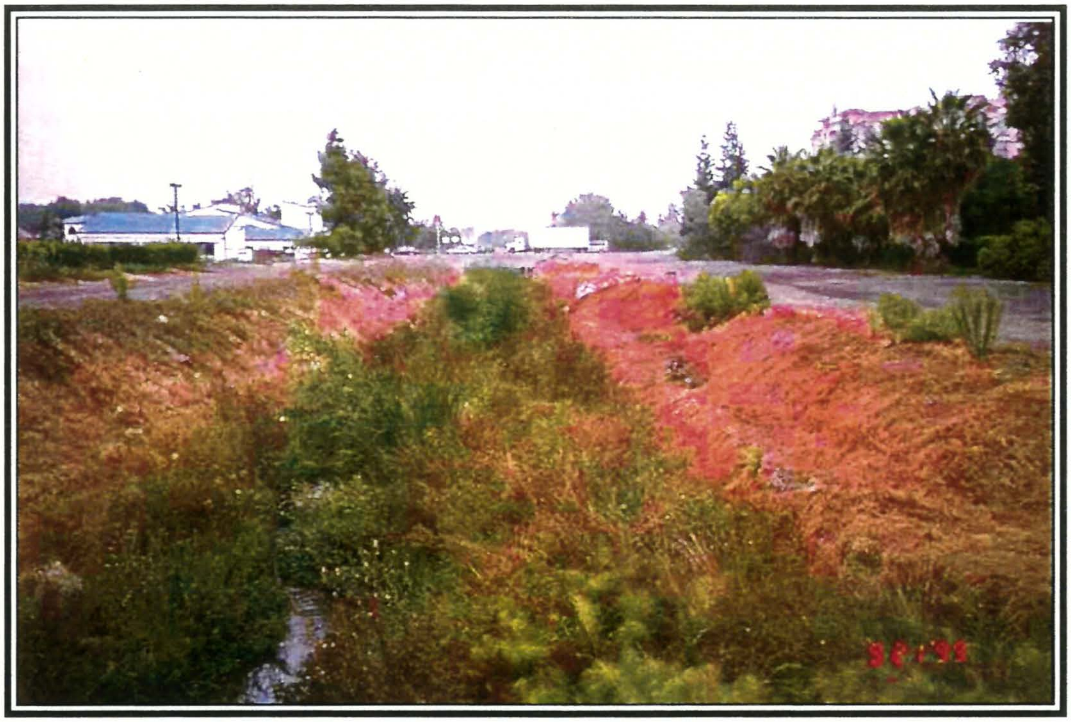
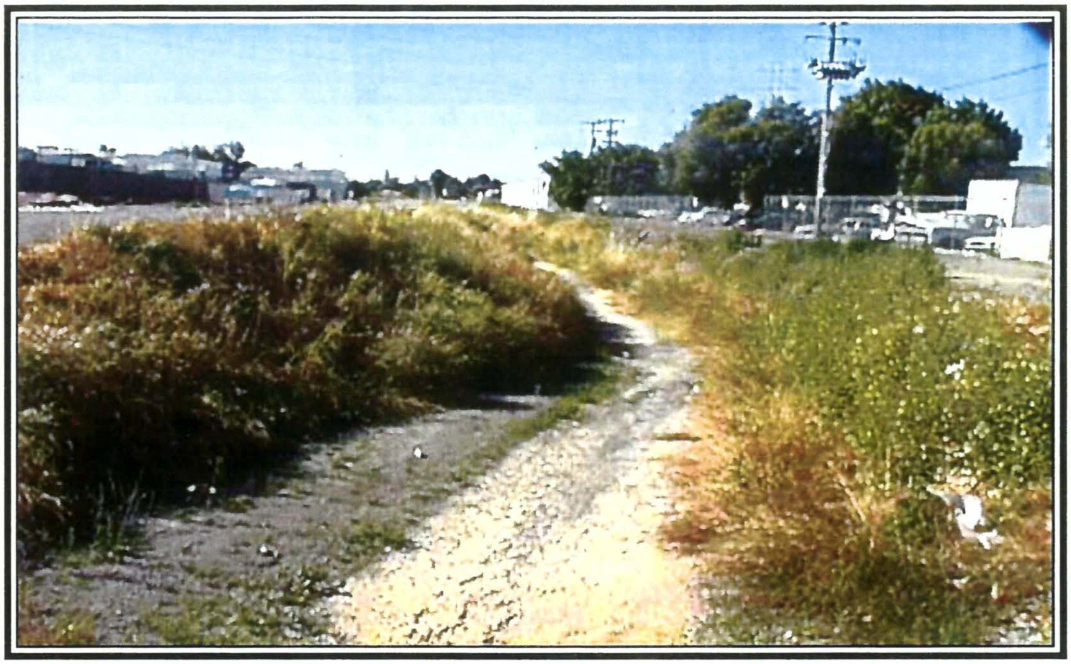
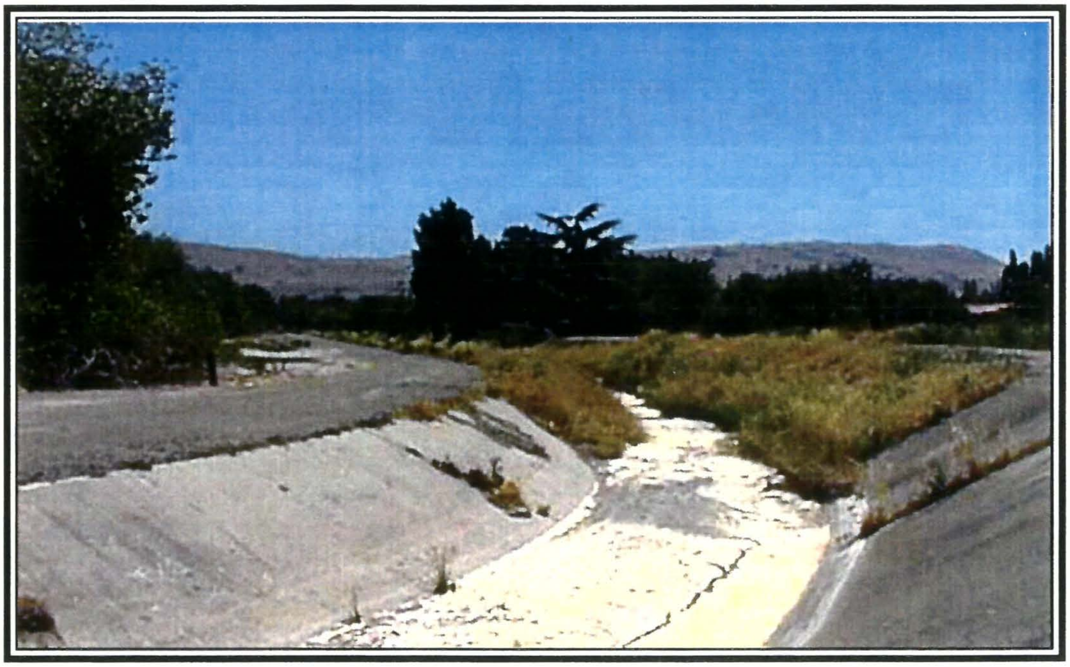


Figure 2. Berryessa from Calaveras to Penitencia. Adjacent Reference Site. Non-native wetland occupies the bench in the foreground; other native dominated wetland patches occupy the low-flow channel. September 1999.

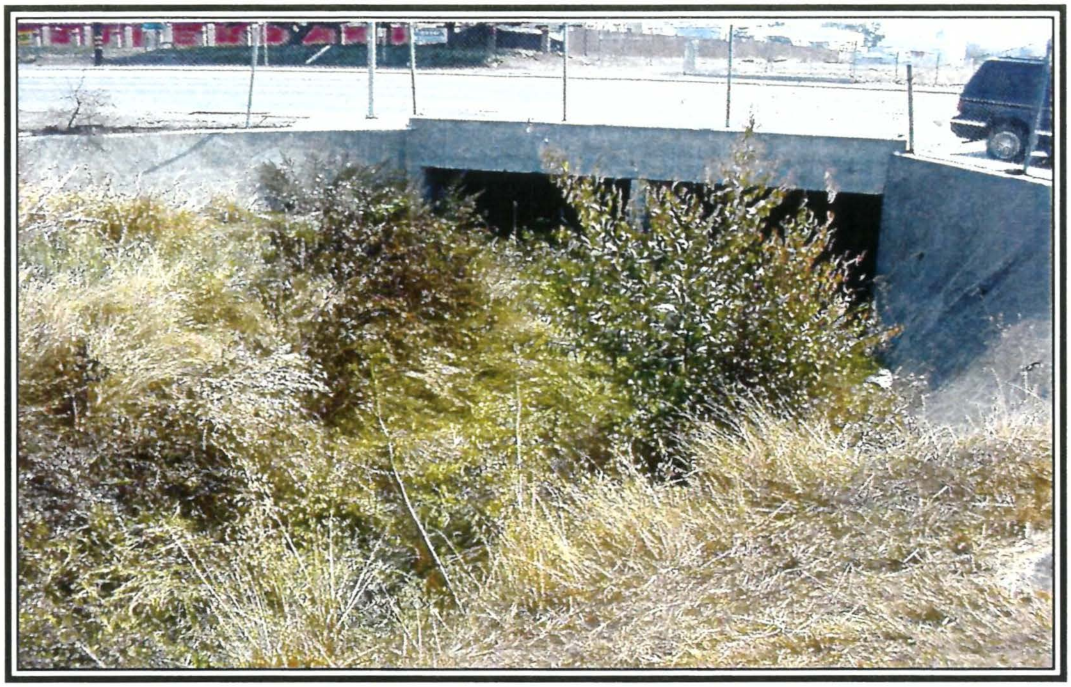


3a. View u/s from Montague Expressway.

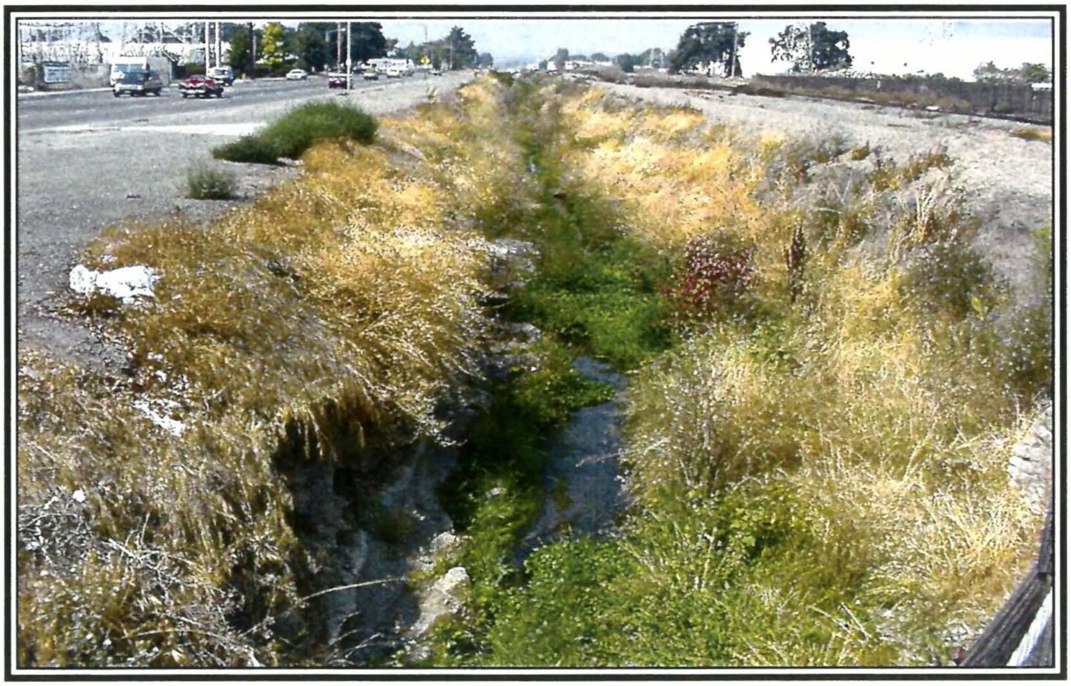


3b. View u/s towards bend.

Figure 3. Berryessa Creek u/s of Montague Expwy: 1998 Excavation Site. June 1999. Most of the wetland on site was located upstream of the photo points.

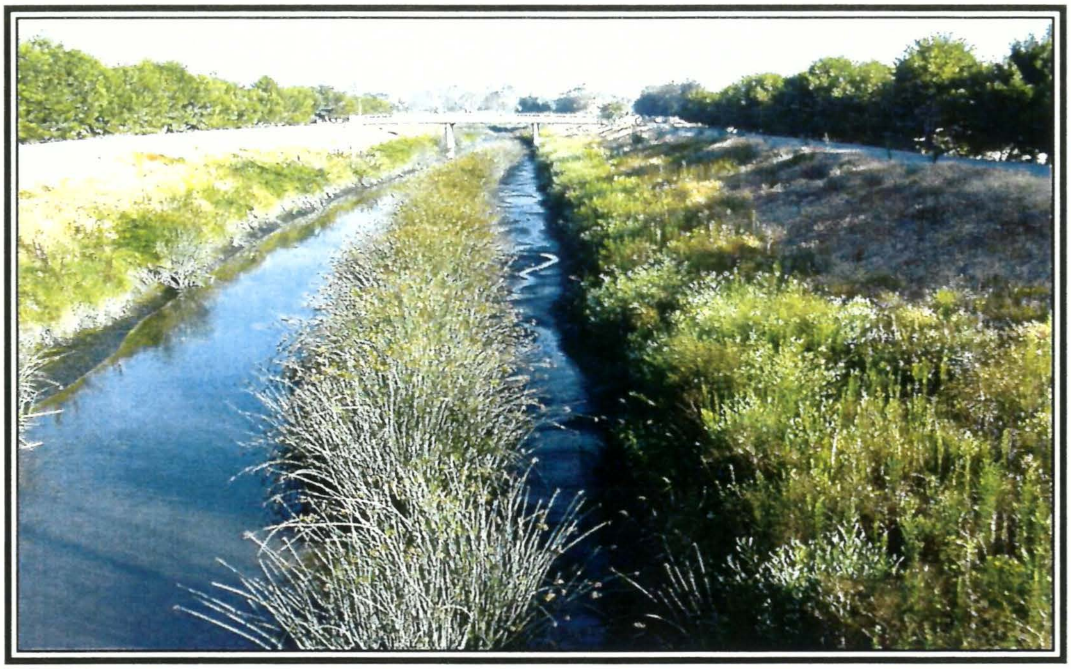


4a. Wetland fringe at toe of slope d/s of Montague Expressway.

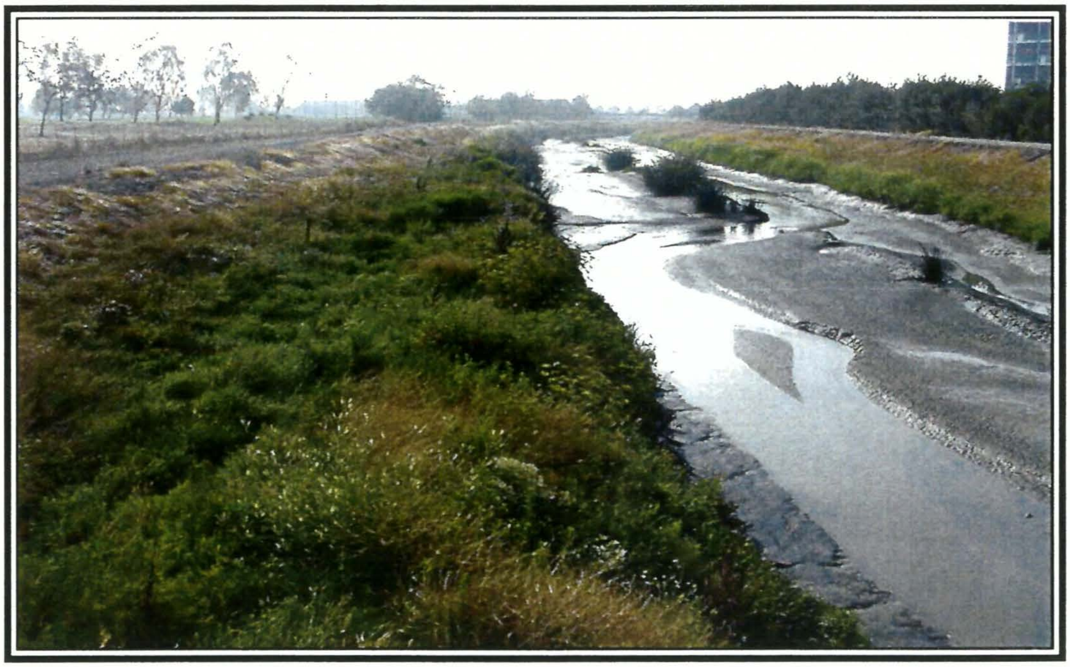


4b. View d/s from railroad bridge towards 2nd railroad bridge.

Figure 4. Berryessa Creek d/s Montague Expressway: Adjacent Reference Site. September 1999.

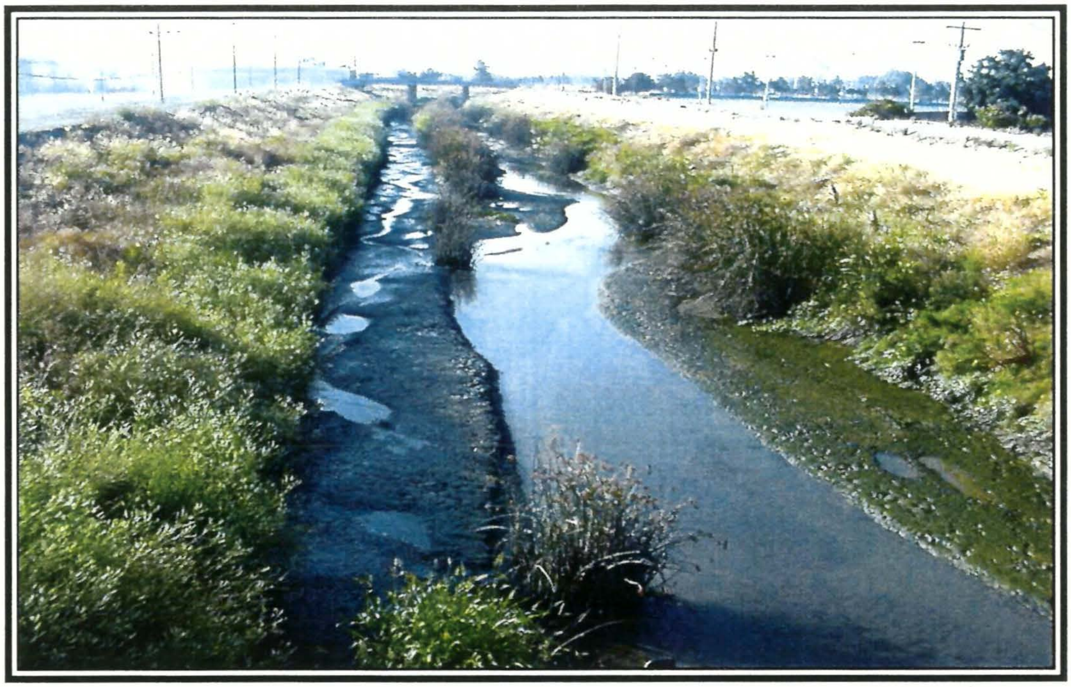


5a. View d/s from Tasman Road. Excavation Site: right bank in photo; Reference Site: left bank in photo.



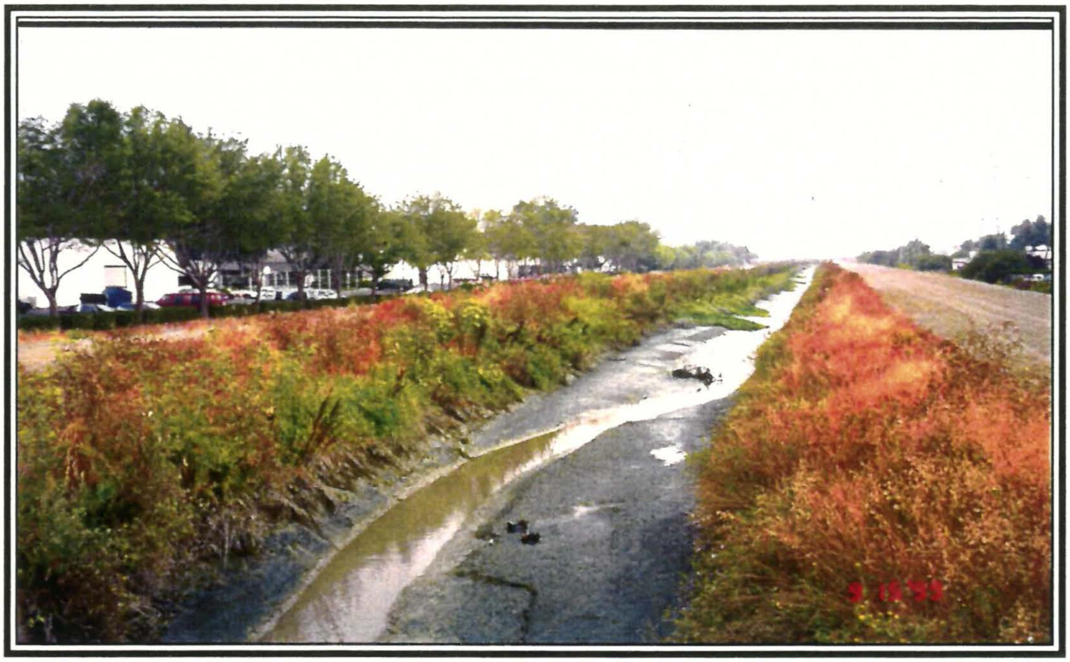
5b. View u/s from Great America Parkway. Excavation Site: right bank in photo; Reference Site: left bank in photo.

Figure 5. San Tomas (tidal) u/s Great America Parkway: 1998 Excavation and Adjacent Reference Sites. First year post-project. August 1999.

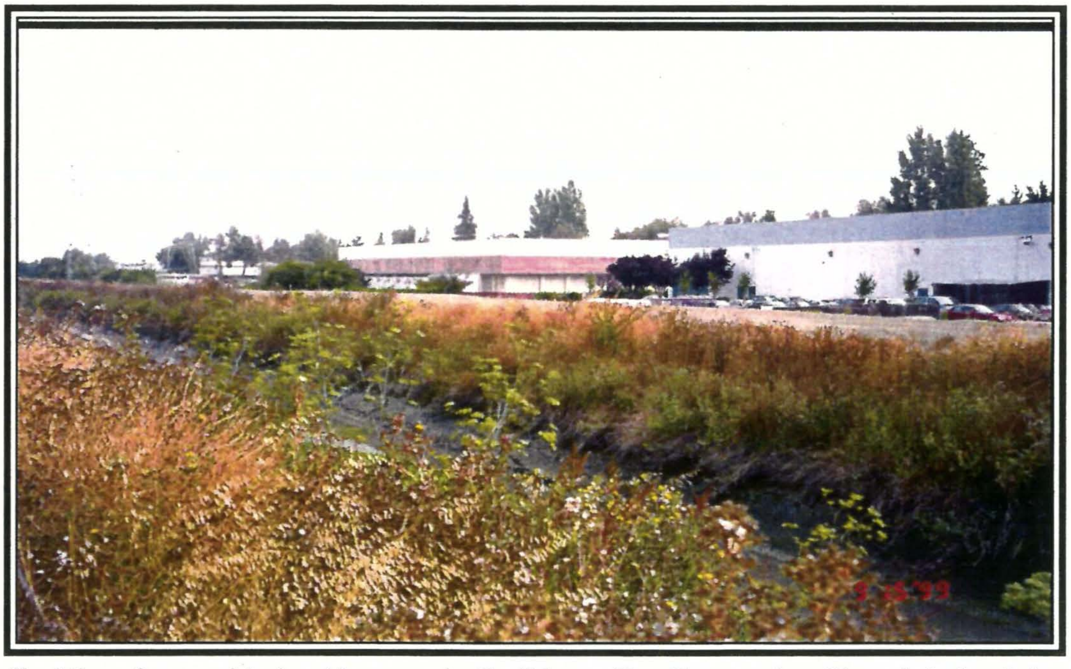


5c. From Tasman Road looking u/s. Excavation Site: left bank in photo. Note the thick cover of *Melilotus alba* along the levy slope.

Figure 5. Continued.



6a. View d/s from Hwy. 237 frontage road. Excavation Site: right bank in photo, with no wetland visible; Reference Site: left bank, note wetland patches extending into channel.



6b. View from mid-site d/s towards Caribbean Dr. Excavation Site: right bank in photo; Reference Site: left bank.

Figure 6. Sunnyvale East 1998 Excavation and Adjacent Reference Site: first year post-project. September 1999.

APPENDIX G
General Reference Site Photographs

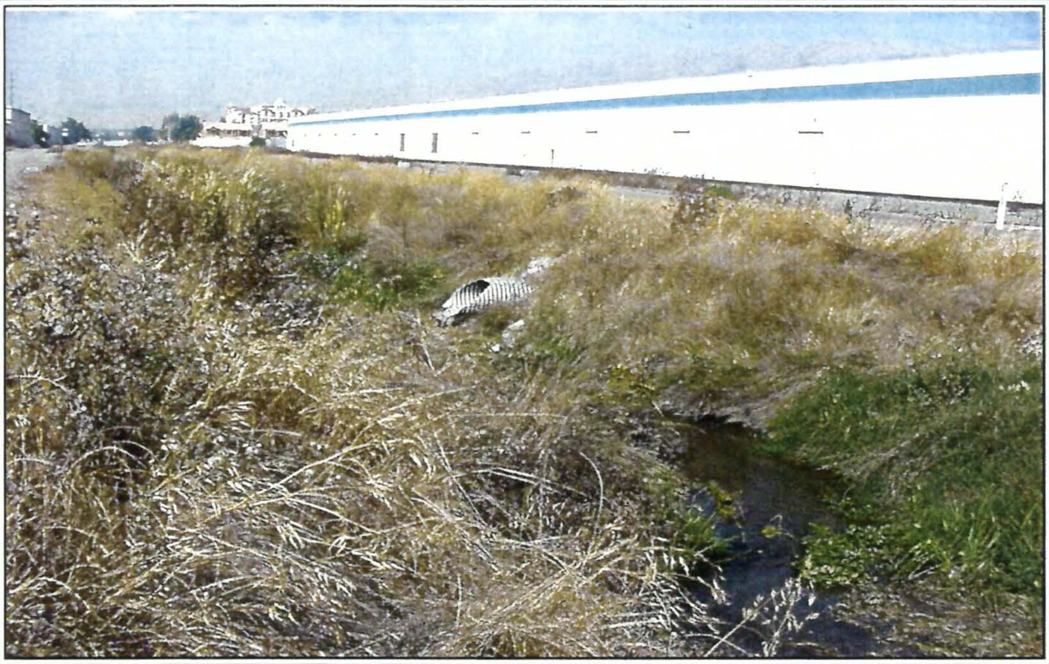


Figure 1. Berryessa Creek General Reference Site (STA 109+85-112+00). View looking downstream. October 1999.

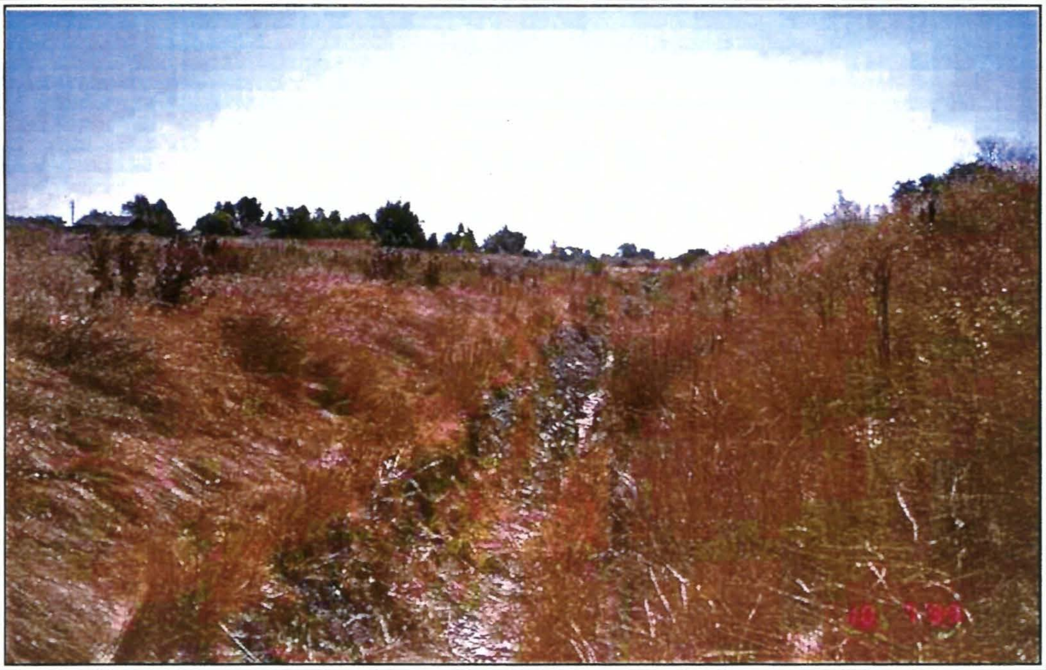


Figure 2. East Little Llagas Creek General Reference Site (STA 45+00-47+20). View looking downstream. October 1999. The stream bed was dry and no wetlands were present.

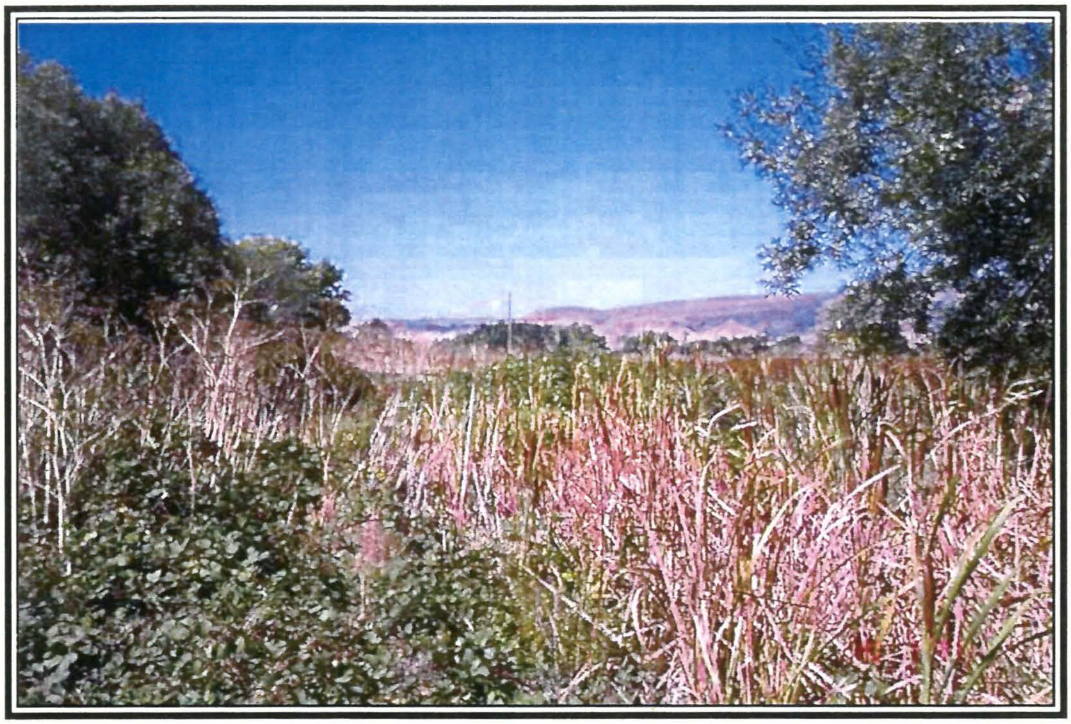


Figure 3. Fisher Creek General Reference Site (STA 149+00-150+00). View looking downstream. October 1999.

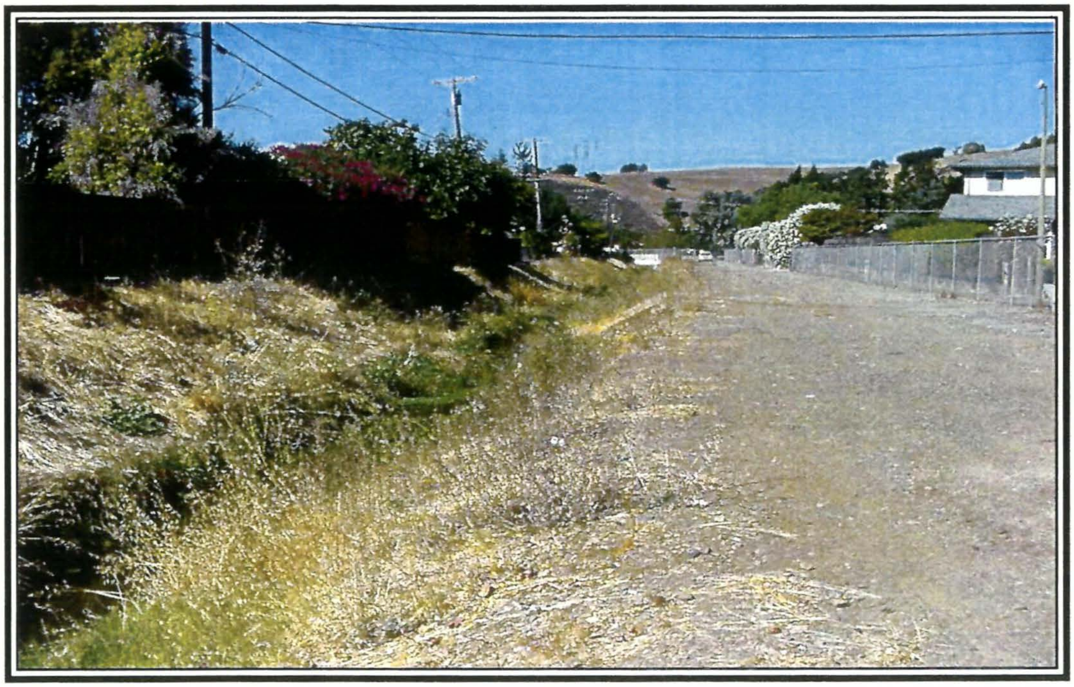


Figure 4. Greystone Creek General Reference Site (STA 11+00-13+10). View looking downstream towards Camden Ave. October 1999.

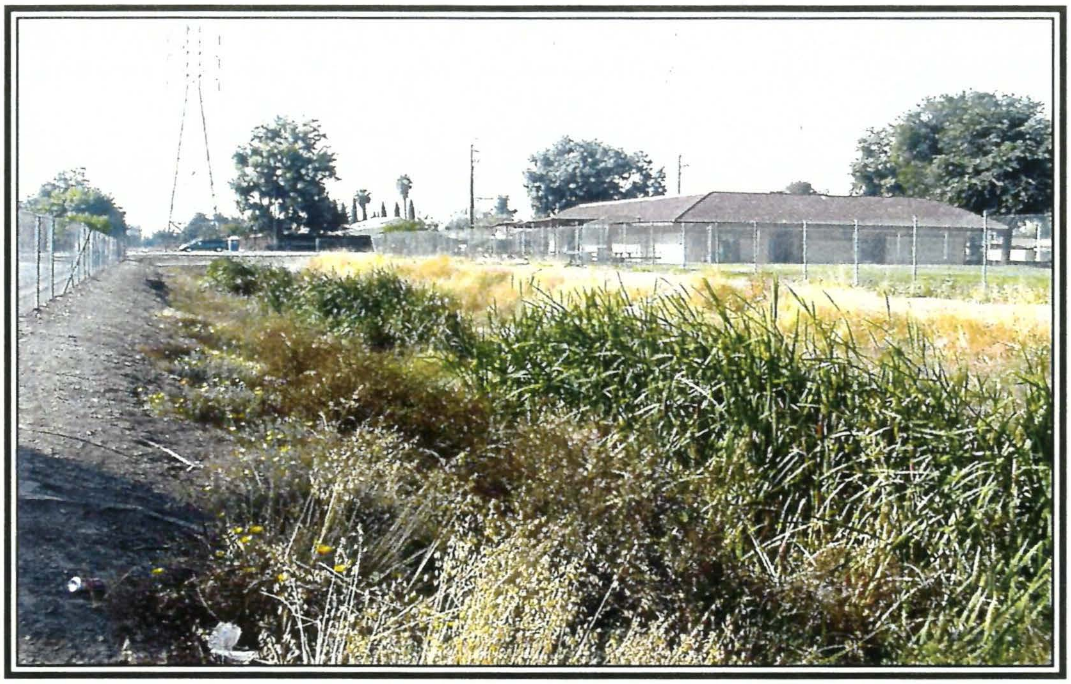


Figure 5. Lower Silver Creek General Reference Site. (STA 373+95-375+00). View Upstream. October 1999.

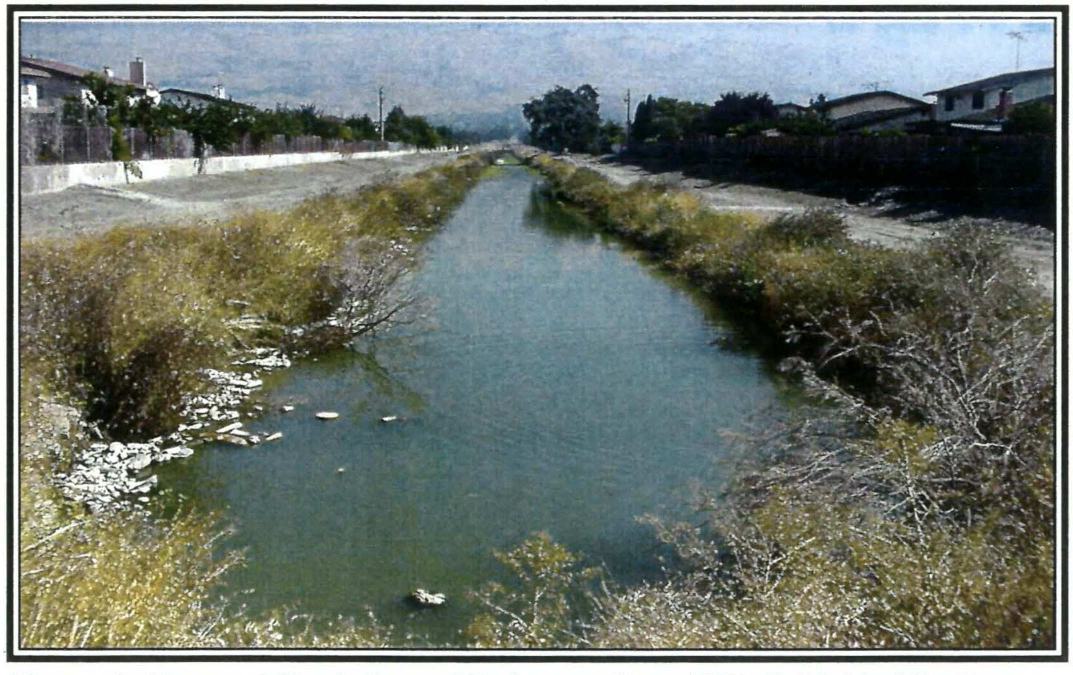


Figure 6. Norwood Creek General Reference Site. (STA 7+80-11+00). From confluence of Norwood and Lower Silver Creek looking upstream towards reference site. There was a sparse, thin fringe of wetland along the bank edge (not visible in photo) at the u/s portion of the sample site. October 1999.

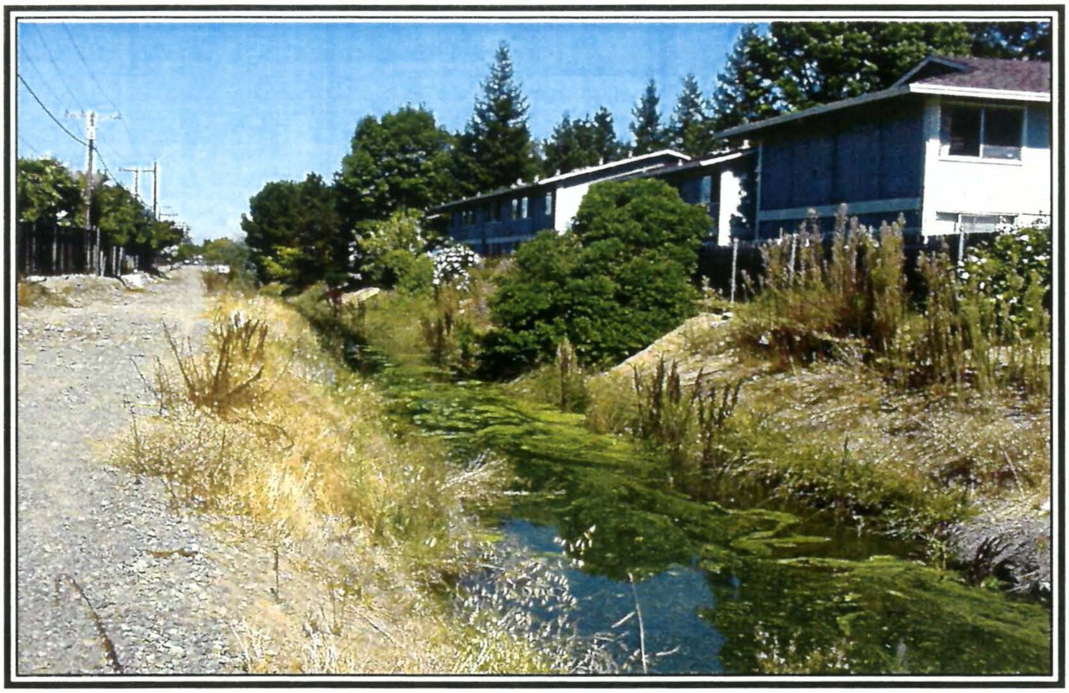


Figure 7. Smith Creek General Reference Site (STA 8+80-10+00). View looking upstream. October 1999.

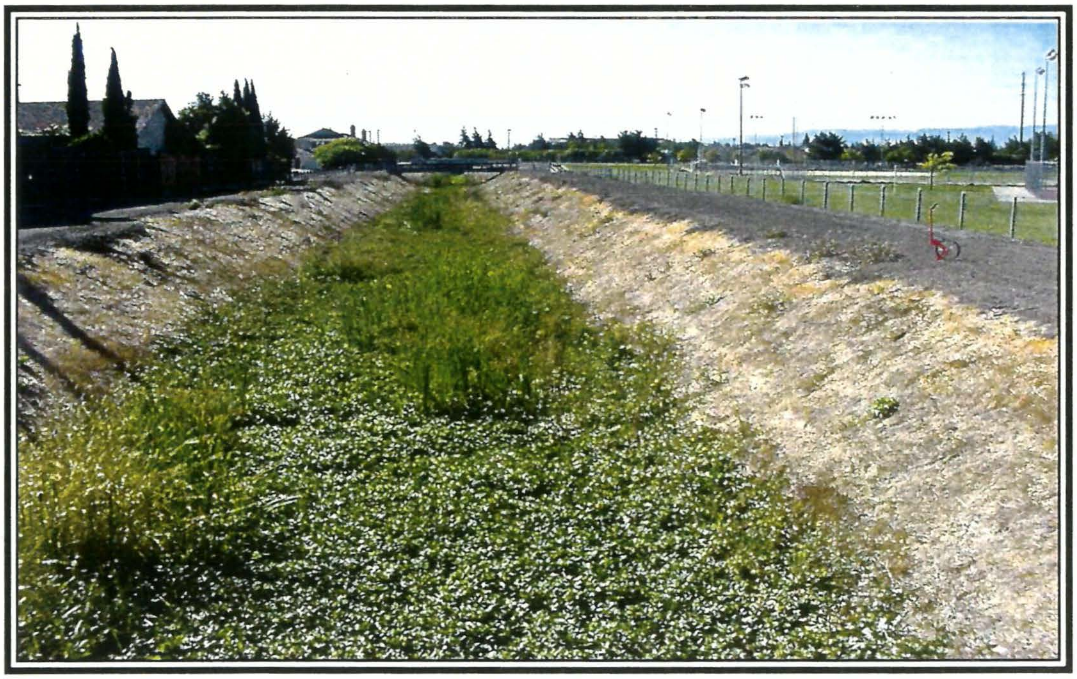
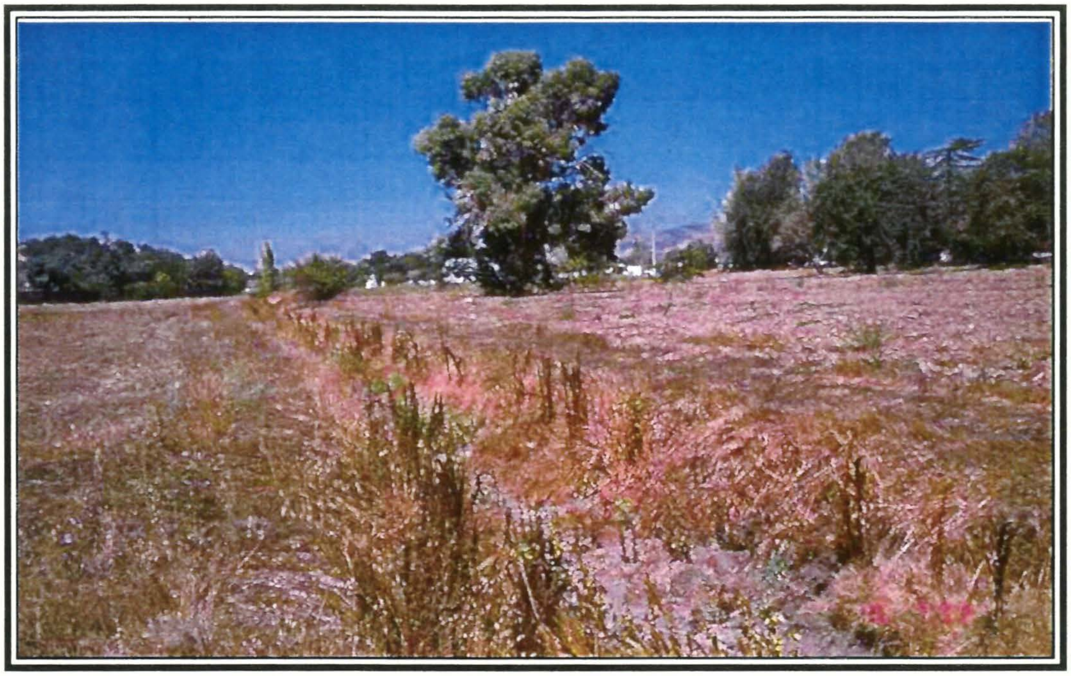
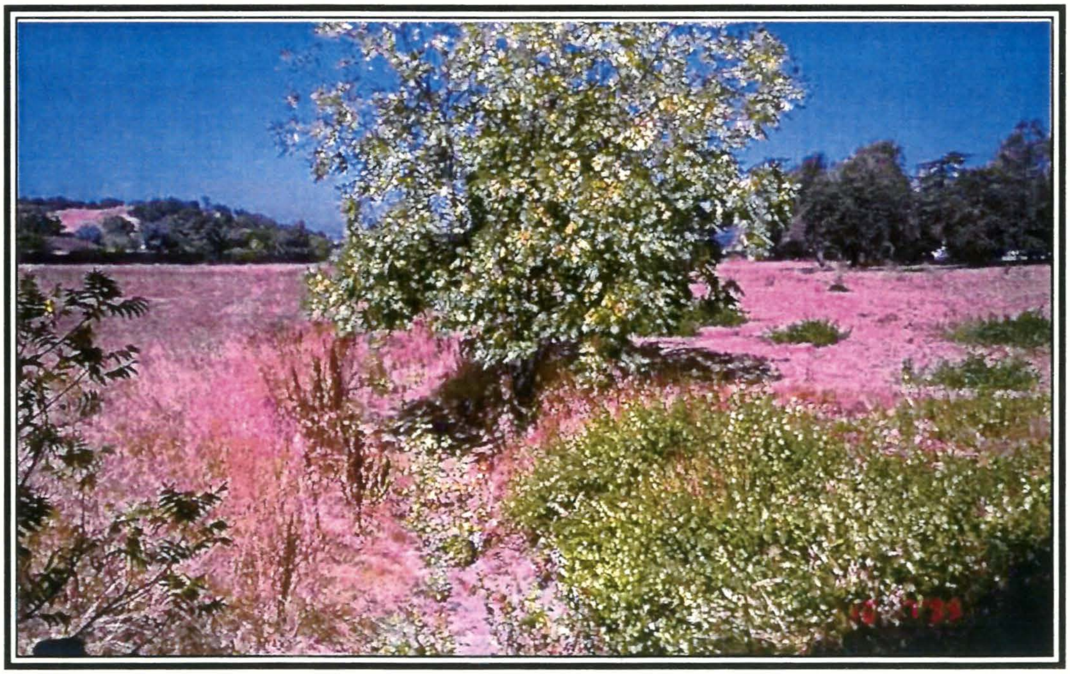


Figure 8. Tularcitos Creek General Reference Site (STA 9+00-12+80). View looking downstream from Pacheco Dr. footbridge. October 1999.

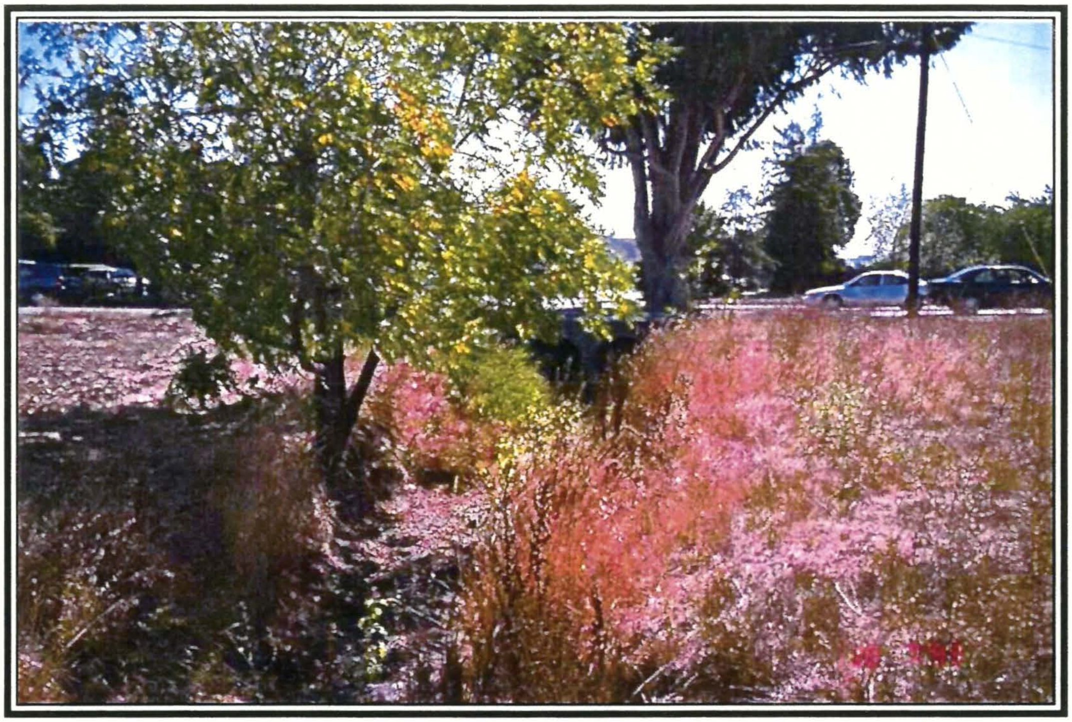


9a. View upstream from mid-site.



9b. View upstream from downstream end of site at Cosmo Ave.

Figure 9. West Little Llagas Creek upstream Cosmo Ave. General Reference Site (STA 100+00-101+00. October 1999. The stream bed was dry and no wetlands were present.



9c. View looking downstream toward Cosmo Ave. from upstream end of sample site.

Figure 9. Continued.

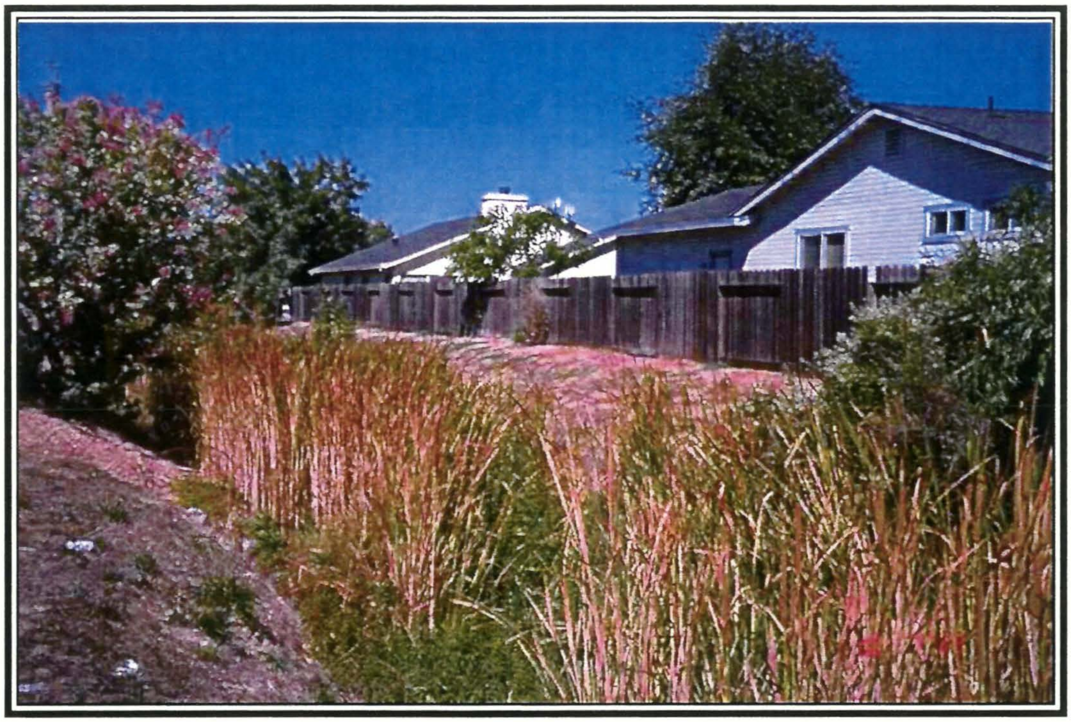
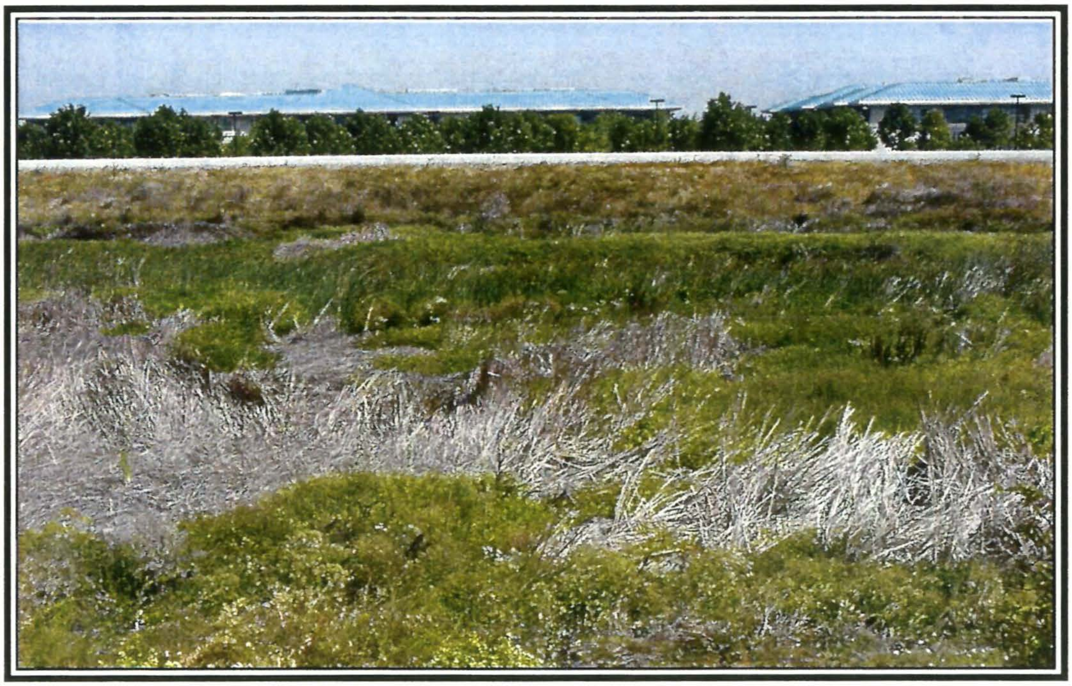


Figure 10. West Little Llagas Creek downstream Main Ave. General Reference Site (STA 152+00-152+80). October 1999.

11a. View over site from right bank looking d/s.



11b. Close up of the right bank of the reference site. Note the dead stalks of *Typha* remaining from the previous year as well as the new growth of *Polygonum punctatum* and *Atriplex triangularis*.

Figure 11. Guadalupe River General Reference Site (STA 318+00-325+50). October 1999.

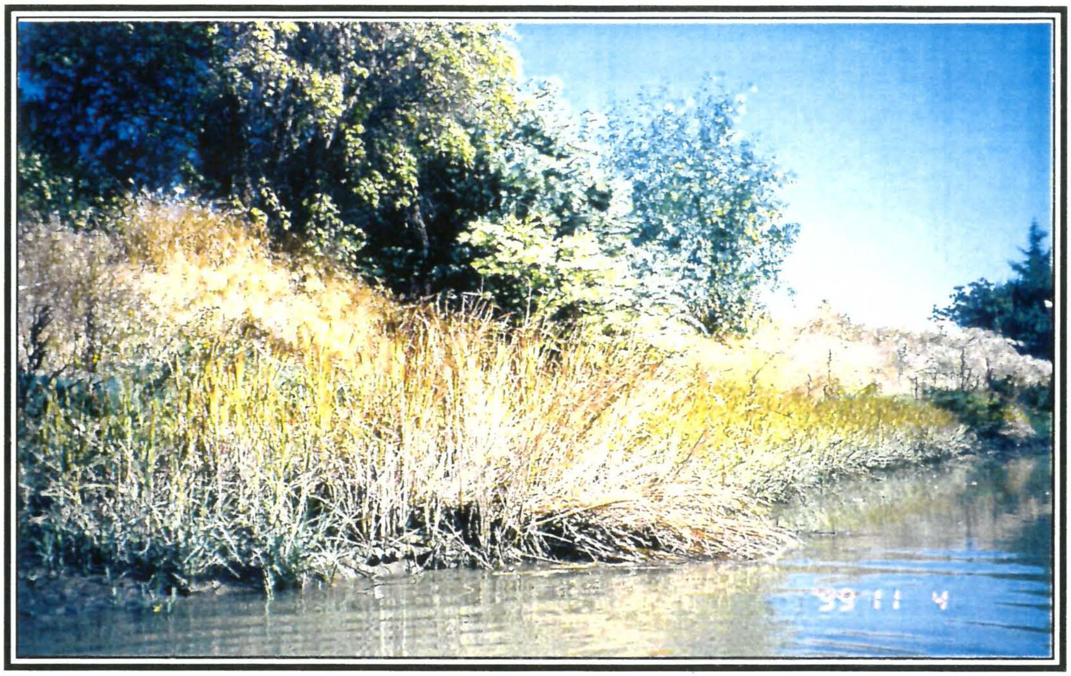


Figure 12. San Francisquito Creek General Reference Site (STA 73+00-74+00). View of west bank at d/s end of site. Note narrow bench of *Spartina foliosa* November 1999.

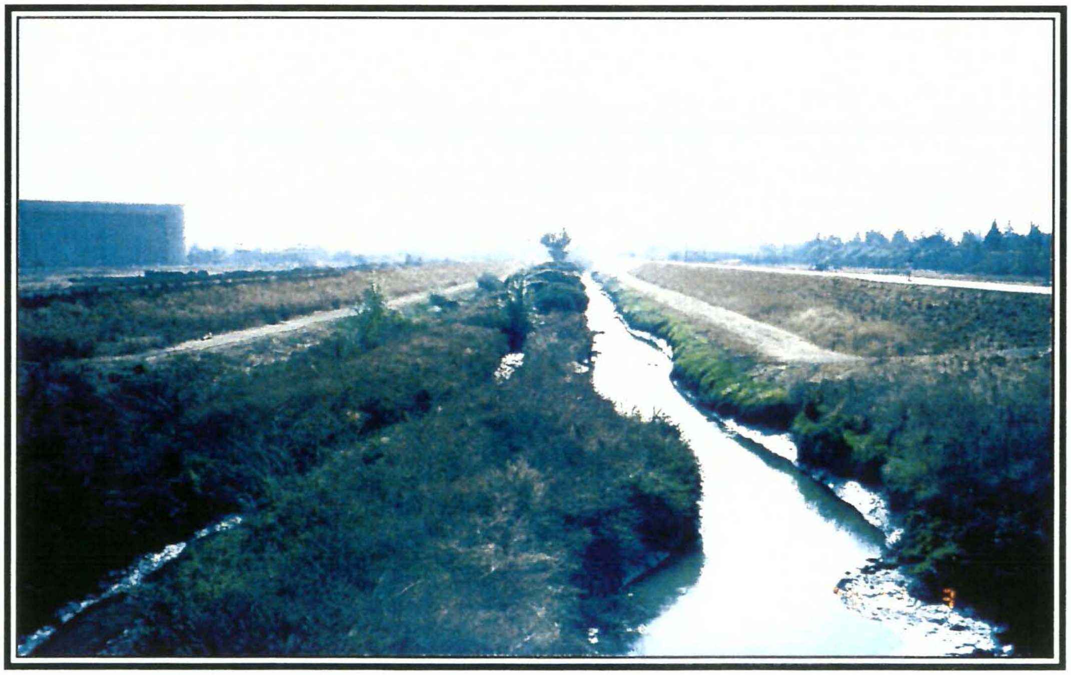


Figure 13. Stevens Creek General Reference Site (STA. 90+00-92+20). View u/s towards site from footbridge. November 1999.

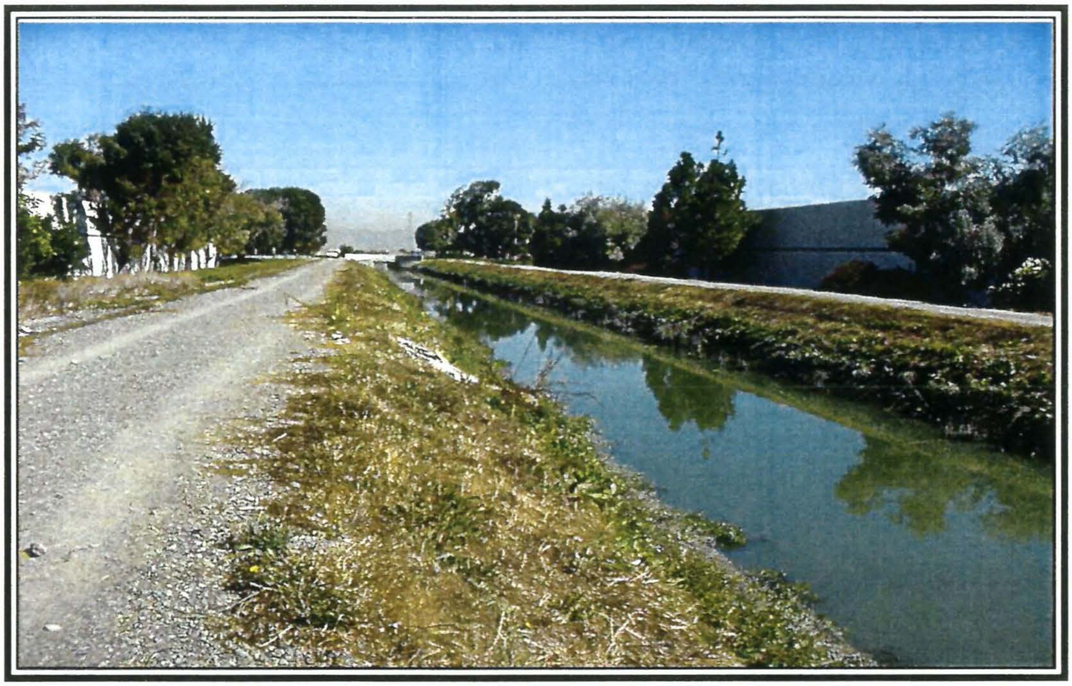


Figure 14. Sunnyvale West General Reference Site (STA 58+00-62+40). View downstream towards Caribbean Ave. There is a thin wetland fringe along both banks. October 1999.

APPENDIX H
Recent Excavation History of Study Sites

Appendix H. Most Recent Excavation of Study Sites

STREAM	HALF CHANNEL EXCAVATION [1]	DATE OF LAST SEDIMENT REMOVAL PROJECT [2]
EXCAVATION STUDY SITES		
1997		
Jones		No Maintenance Record [3]
Lower Penitencia	X	1990
Los Coches		1991
North Morey		No Maintenance Record [4]
South Morey		No Maintenance Record [4]
San Tomas (tidal) u/s Highway 237	X	1991
San Tomas (nontidal) u/s of Central Expressway		1991
Saratoga		1993
1998		
Berryessa u/s Lower Penitencia	X	1989, 1991, 1993
Berryessa u/s Montague Expressway		1984, 1987
San Tomas (tidal) u/s Great America Parkway	X	1988
Sunnyvale East		1986
ADJACENT REFERENCE SITES		
Berryessa d/s Los Coches Avenue		1984, 1989
Jones		No Maintenance Record [3]
Lower Penitencia	X	1990
Lions		No Maintenance Record [4]
South Morey		No Maintenance Record [4]
San Tomas (tidal) d/s Highway 237	X	1988
Saratoga		1988
Berryessa d/s Montague Expressway		1988
San Tomas (tidal) u/s Great America Parkway	X	1988
Sunnyvale East		1986
GENERAL REFERENCE SITES		
Nontidal		
Berryessa u/s Los Coches Avenue		1988
East Little Llagas		No Maintenance Record [5]
Fisher		1986
Greystone		1988
Tularcitos		1984
Lower Silver		1982
Norwood		1986
Smith		1986
West Little Llagas u/s Cosmo Avenue		1988
West Little Llagas d/s Main Avenue		1984
Tidal		
Guadalupe River	X	1990
San Francisquito		1993
Stevens	X	1986
Sunnyvale West		1981

[1] Per CDFG MOU on these sites, only one side of the channel can be excavated in any one year.

[2] Some sediment removal projects only affected a portion of the total site.
In these cases, all the most recent projects which collectively include the entire length of the site are listed.

[3] Maintained farmers ditch, no construction date

[4] Built in 1988 by NRCS

[5] Built 20-30 Years Ago by State Highway Department

APPENDIX I
Routine Vegetation Management on Study Sites

Appendix I. Routine Vegetation Management on Study Sites

Study Site	Planned Routine Vegetation Control Activity	Planned Routine schedule	Work done since 1997
1997 EXCAVATION STUDY SITES			
Jones	NO WORK	no work	same as planned
Lower Penitencia	AQUATIC HERBICIDE APPLICATION[1]	annual	same as planned
Los Coches	AQUATIC HERBICIDE APPLICATION	annual	same as planned
North Morey Channel	WOODY/AQUATIC VEG. REM. HAND LABOR-INSTREAM[2]	annual	same as planned
South Morey Channel	WOODY/AQUATIC VEG. REM. HAND LABOR-INSTREAM	annual	same as planned
San Tomas Aquino u/s Hwy. 237	AQUATIC HERBICIDE APPLICATION - WOODY ONLY [3]	annual	same as planned
San Tomas Aquino u/s Central Expwy	AQUATIC HERBICIDE APPLICATION - WOODY ONLY	annual	same as planned
Saratoga	AQUATIC HERBICIDE APPLICATION - WOODY ONLY	annual	cattails sprayed in 1999
1998 EXCAVATION STUDY SITES			
Berryessa u/s Lower Penitencia	AQUATIC HERBICIDE APPLICATION	annual	annual
Berryessa u/s Montague Expwy	AQUATIC HERBICIDE APPLICATION	annual	same as planned
San Tomas Aquino u/s G. America Pkwy	AQUATIC HERBICIDE APPLICATION -WOODY ONLY[3]	annual	same as planned
Sunnyvale East	AQUATIC HERBICIDE APPLICATION	annual	same as planned
ADJACENT REFERENCE SITES			
Berryessa d/s Los Coches Ave.	AQUATIC HERBICIDE APPLICATION	annual	same as planned
Jones	NO WORK	no work	same as planned
Lower Penitencia	AQUATIC HERBICIDE APPLICATION[1]	annual	same as planned
Lions	WOODY/AQUATIC VEG. REM. HAND LABOR-INSTREAM	annual	same as planned
South Morey	WOODY/AQUATIC VEG. REM. HAND LABOR-INSTREAM	annual	same as planned
San Tomas d/s Hwy 237	NO WORK	no work	same as planned
Saratoga	AQUATIC HERBICIDE APPLICATION -WOODY ONLY	annual	same as planned
Berryessa d/s Montague Expwy	AQUATIC HERBICIDE APPLICATION	annual	same as planned
San Tomas Aquino u/s Great America Pkwy	AQUATIC HERBICIDE APPLICATION -WOODY ONLY[3]	annual	same as planned
Sunnyvale East	AQUATIC HERBICIDE APPLICATION	annual	same as planned

Appendix I. Continued.

Study Site	Planned Routine Vegetation Control Activity	Planned Routine schedule	Work done since 1997
GENERAL REFERENCE SITES			
Nontidal Sites			
Berryessa	AQUATIC HERBICIDE APPLICATION	annual	same as planned
East Little Llagas	NO WORK	no work	same as planned
Fisher	WOODY/AQUATIC VEG. REM. HAND LABOR-INSTREAM	not performed recently	no work
Greystone	AQUATIC HERBICIDE APPLICATION	annual	same as planned
Tularcitos	AQUATIC HERBICIDE APPLICATION	annual	same as planned
Lower Silver	AQUATIC HERBICIDE APPLICATION	annual	same as planned
Norwood	AQUATIC HERBICIDE APPLICATION	annual	same as planned
Smith	AQUATIC HERBICIDE APPLICATION	annual	same as planned
West Little Llagas u/s Cosmo St.	WOODY/AQUATIC VEG. REM. HAND LABOR-INSTREAM	annual	same as planned
West Little Llagas d/s Main St.	WOODY/AQUATIC VEG. REM. HAND LABOR-INSTREAM	annual	same as planned
Tidal Sites			
Guadalupe River	AQUATIC HERIBCIDE APPLICATION-WOODY ONLY	annual	same as planned
San Francisquito	AQUATIC HERIBCIDE APPLICATION-WOODY ONLY	not performed recently	no work
Stevens	AQUATIC HERBICIDE APPLICATION	annual	same as planned
Sunnyvale West	AQUATIC HERBICIDE APPLICATION	annual	same as planned

1 - Aquatic herbicide application includes both herbaceous and woody plants

2 - Sites receiving "aquatic heribicide - woody only" treatment also have woody vegetation hand removal every two years

3 - On this site includes only removal of non-natives such as pampas grass and woody non-natives